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Archive

The Subscription Magazine for Archimedes Users

Choosing a Database

ARM3 versus Acorn FPU

The A540 – where is it? (Comment Column)

Reviews: Desktop Office, Careware Nº8, Geoscan Geographical Database, Tabs 3D Model Maker, Fun School 2, Personal Accountant, The Accounts Program, The Invoice Program.

Vauxhall Street, here we come!

The observant among you will have noticed the significance of the password that has been used for the Archive Bulletin Board this last couple of months – Vauxhall. This relates to the fact that we have just purchased a new property for Norwich Computer Services at 96a Vauxhall Street. It was actually built as an R.S.P.C.A. clinic but has been owned for many years by Messers Hutchins & Sons Ltd who have been printing Archive Magazine since Volume 1 Issue 1.

Vauxhall Street is still not huge, but it will give us quite a bit more room to move than the three rooms that we were using at the Beverley's private residence in Mile End Road. Unfortunately, although Vauxhall street is no more than 1/2 mile away from Mile End Road, it is in a different Telecom area so all the phone numbers will have to change!

We don't know the exact date of our move but mail can still come to 18 Mile End Road as that is still going to be 'home' and as soon as the phone numbers change, BT will be putting an announcement on the old number giving the new one. We hope to be getting a second fax machine so that either will be usable in the mean time.

The extra work-load of trying to get Vauxhall Street ready is the main reason for the delay in this issue. Sorry about that but we hope that the December issue will be back on schedule.

Thanks for the articles

After my comments about the lack of technical articles, we have had quite a few ideas and offers of articles. In particular, two articles that will be going in the December issue are one about typography and layout for DTP and another which explains how to get extended memory working with the PC Emulator. Thanks to all who have contributed, but there is always room for more.

Once again, thanks for all your support.

With best wishes,

Paul B

Government Health Warning – Reading this could seriously affect your spiritual health.

"Why do you recommend Christianity so strongly – even at the risk of upsetting people and losing subscribers?" Well, as I said last month, it's **not** because I think Christianity is "good" or "helpful" or "satisfying", though all of those may apply. It is quite simply because I think it is "true".

Now in these days where tolerance of other people's views is extolled as such a virtue, this kind of statement is not too popular but let me express it in the words of one more eloquent than I...

> Truth is incontrovertible. Panic may resent it;
> ignorance may deride it; malice may distort it;
> but there it is.

I keep coming back (and will continue to do so) to the fact that it is Jesus who makes "outrageous" claims of uniqueness, not me – I just report them. Yes, he makes some wonderful promises to us about love, joy, peace etc but he also says we **must** respond to him – that our response to him is what determines our eternal destiny. Popular teaching? No, but the question is, "Is it true?"

Archive

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Contents

Archive magazine is edited by Paul Beverley and published by Norwich Computer Services.

Products Available

Christmas Sale! – Because we are just about to move to our new premises, we want to reduce the stock levels of some of the physically larger items, so there are going to be some unrepeatable offers, strictly while stocks last. The details will be on the insert in the Price List. Please ring to check availability before sending any money.

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• **!Works Tools #1** (£10) from Jim Markland Software explains the DXF format of !Draw files, has some BASIC utilities and allows you to incorporate your own vector graphics in DTP.

• **!Works Tools #2** (£30) is a contouring application for surface modelling. It outputs MTV polygons, DXF, sprite and Euclid format files.

• **3.5" best quality branded discs** from Archive are now down to £13 for 10 or £60 for 50.

• **A3000 Ram board** prices down. Atomwide 1M £80, 4M £275, Morley 1M £80, 4M £255.

• **Amazing Ollie** is one of Storm Software's first educational programs for the Archimedes. It is aimed at children aged 4+ and covers number recognition, counting, adding, maze solving and hand-eye coordination. £13.95 +VAT or £15 through Archive.

• **Astro** is a set of interactive programs from Topologika for exploring space. It is aimed at upper primary and secondary school students. The price is £19.95 or £18 through Archive.

• **Auto-Loaders** – We have now managed to get a working system for formatting and copying Archimedes discs. It attaches to a standard Archimedes computer (even an old 310 will do) via a 5.25" interface and a serial lead. You can put 50 discs in at a time which it either feeds out to a main output hopper when copied or into a reject bin if the disc does not verify properly. If anyone is interested in buying one, we can supply them, including software, leads etc for £2,300 + VAT (£2,645). If we could buy more than one at a time, we would be able to get discount from the suppliers, so let us know if you are interested.

• **Base5 DBMS** is a suite of BASIC V functions and procedures designed to implement database programs. Currently it is only 'RISC-OS compatible' but soon it will be fully multi-tasking. For a list of the features, see the advert on page 14. The price is £69 (no VAT) from Base5 or £5 for a demonstration disc refundable on purchase of the full system.

• **BugHunter in Space** – is the sequel to Bug Hunter's adventures on earth. £17.95 from Minerva or £17 through Archive.

• **Careware Nº10** – The latest Careware disc which is now available includes three educational games: Mathematical invaders, maze game with questions on English, History, Geography, Maths and Science and a hangman type game. The other items on the disc are a bridge hand lister, solitaire game, 6 puzzles and a rubik cube program.

• **Chocks Away** is 4th Dimension's new flight simulator. You are the pilot of a biplane with various missions to fly. Alternatively you can have two-player dog-fights. £24.95 or £23 through Archive.

• **Coffee** is a role play package from Storm Software, aimed at children aged 9 – 15. It brings in elements of maths, geography, history, english, science and environmental studies. The price £27.95 +VAT or £29 through Archive.

• **Drop Ship** is an arcade game from 4th Dimension in which you have to pilot your spaceship around through various scenes with a range of nasties trying to put an end to your life. It is very reminiscent of Rotor from Arcana Software. Price £19.95 or £18 through Archive.

• **Honeypot** is Resource's "imaginative and enjoyable approach to primary technology". The pack contains three story books, an A3 picture book, a photocopiable teacher's book and two computer programs; one allows children to "walk" down Honeypot Lane, the centre of the imaginary village; the other enables children to combine their own text with pictures. £44.25 from Resource or £42 through Archive.

• **Kaptain Konflict** – "the ultimate combat experience" in which you "face enemy soldiers, take the buildings, blow up the installations". £19.95 from Calderglen Computers.
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• **Ollie the Octopus Sketchpad** is an art package from Storm Software, again aimed at children aged 4+ and is also £13.95 +VAT or £15 through Archive.

• **PAL Colour encoder** – Pineapple Software have produced a colour encoder for the Archimedes which takes the standard RGB output from the computer and encodes it into a composite signal. This means that you can take the output into any VTR that has a composite input and record the output from the computer or you could use it to drive a colour monitor that has a composite input. The cost is £69 +VAT.

(N.B. For the non-technical readers, this is ***not*** *a modulator, i.e. it is* ***not*** *intended to provide a TV type signal. We have been asked by a number of people if we know where they can get a TV modulator but we don't. However, there must be some around as ZCL are providing them with their JetSet packs – see last month's Products Available column. Ed.)*

• **Personal Accounts 2** – Apricote Studios have now produced version 2 of their Personal Accounts package. It is fully multi-tasking, has a bigger description space, you can save reports as a text file instead of immediately printing them, a notepad window has been added and there are a number of other smaller improvements. (See the review on page 54 and the advert on page 5.) The price has changed because Apricote Studios are now VAT registered. The Account Book and The Invoice Program are now £34.95 each (£32 through Archive) or if you buy them both at the same time, they are only £59.95 (£59 through Archive).

• **Price changes** – The new Computer Concepts 600 d.p.i. Laser HiRes has gone up in (Archive) price from £1490 to £1560 because CC didn't include the price of the toner cartridge when they did their costing and, obviously, you can't supply the laser printer without one. These printers are now available from stock. (Check the Price List insert to see if we have any available on special offer at the moment.)

• **ProText 5.0** is the first offering into the Archimedes market from Arnor Ltd. It is a mature word-processor currently available for IBM, Atari and Amiga, now ported across onto the Archimedes. At £149.95 inc VAT (or £135 through Archive) it offers a wide range of WP and mailmerge facilities, including a 110,000 word dictionary and has a programming language (which, as a Wordwise Plus devotee, I will be interested to see). It is due to be released before this magazine is printed.

• **Pysanki** is yet another new offering from 4th Dimension. This is an arcade game reminiscent of a space age version of Repton though it seems more sophisticated. Price is £19.95 or £18 through Archive.

• **Shareware N°36** is now ready. It contains various applications: 3D graph plotter, Cash book and Stock control. Two music related programs: Soundtracker module fixer and a Midi recorder. The rest of the programs come under the heading of utilities: Hard disc backup (also does SCSI), File filter, Font availability manager, File type guesser, VIDC mode info, Desktop wastebin, ANSI terminal escape sequence emulator module, Improved communications enhancer module, Module disassembler.

• **Sprite files galore** – Micro Studios have produced three packs of sprite files on different subjects – World Wildlife, Pre-historic animals and History: Costume. They cost £19.95 each (inc VAT) or £18 through Archive. (Micro Studio are working on !Draw versions of many of these sprites – the !Draw version of an allosaurus which they put on an examples disc for us was **very** impressive and must have taken ages to create.)

• **TCP/IP Protocol Suite** from Acorn Computers provides file manipulation, terminal access and electronic mail in a mixed network environment; Econet, Ethernet, Sun NFS etc. It is available as a single user package for £228.85 (£195 through Archive) or a site licence for £1144.25 (£995 through Archive). There is also a Programmer's Pack for £50 (£48 through Archive) which provides the information needed for programmers wanting to access the software at different levels.

• **The WIMP Game** is another excellent game from the 4th Dimension. It is a fully multitasking application so you could have it on your desktop while you were also doing some other work! Basically, it is an image based adventure game starting in a darkened lounge, the aim being to progress from being an Acorn Atom owner to owning an R200 workstation. Price £19.95 or £18 through Archive.

• **Tiny Logo** is a new implementation of Logo from Topologika and is aimed at young children. Some of the facilities can be disabled if required to make it

less confusing for younger users. The pack includes Tiny Draw, a mouse/icon controlled painting package for infants and lower juniors. The price is £29.95 or £28 through Archive.

Review Software Received...

We have received review copies of the following software: !Works Tools #1 and !Works Tools #2; Drop Ship; The WIMP Game; Pro-Text 5; Micro Studio's History Costume, Prehistoric animals and World wildlife; !Orrery; RoboLogo; Armatron from Z & Z Software; Starfleet Encounter; BugHunter in Space; Chocks Away. Also, if anyone wants to review any of the later Shareware and Careware discs except S34, 35 and C8, please let us know. A

Help!!!!

• **DTP** – Can we have more about fonts, please? Gerald Fitton's article was excellent. Can someone give us some information on how to get output from the Archimedes (Impression, etc) published. Do outside publishers accept output in that form?

One book I can recommend on DTP is "Design for desktop publishing" by John Miles, published by John Taylor Book Ventures. It cost me £8 from Dillons and is an excellent buy. Eddie Lord, Crawley.

• **Silicon Vision's PCB Professional** – Is there anyone out there using PCB Professional? I am not entirley happy with the product and would like to compare notes with other users. Keith Hodge, 16 Mold Road, Mynydd Isa, Clwyd, CH7 6TD. (Phone 0352–55331 daytime.)

Help offered

• **Best Fit Program** – In Archive 4.1 p 17 Barry Joyce asked for a best fit program. A program has been sent in by Lorcan Mongey (written by a friend of his) which was originally developed on the BBC Master. Lorcan says: "It has the very useful feature that the user can choose how many terms to use in the curve-fit expression and also what form each term has, e.g. x, x^2, SIN(x), e^x or whatever. The program then calculates the coefficients of these terms which gives the best curve-fit, outputting the resulting equation along with RMS error and peak error. Because it uses EVAL to evaluate the user's expressions, you can even supply your own FN definitions – it really is completely general. A copy of the program is on this month's program disc."

• **Christmas Carols** – Those of you with copies of Rhapsody may like to have a few seasonal ditties. These have been donated by David Crofts and are on this month's program disc.

• **Converting PC Graphics files** – In Archive 4.1 p17 Peter Sykes asked whether you could convert PC graphics data into Archimedes sprites. The latest version of !Translator (6.01) claims to handle .PCX and .IMG formats. Also versions 0.62 and 0.69 of ChangeFSI both list .PIC files among their formats. You can get !Translator updates from the author (his name and address are given in the program. ChangeFSI, unfortunately, is no longer PD. Lorcan Mongey

(A copy of !Translator v6.23 has been put on this month's program disc, Ed)

• **HP PaintJet RISC OS Driver** (Archive 4.1 p 11) – There are two HP PaintJet RISC-OS drivers commercially available, one from Clares and the other from Ace. **They cost about £15 each. The Acorn LaserJet driver works well with a PaintJet** if you select 150 dpi, but it's black-and-white only (with grey-scales for colours) and the printout comes out at 5/6 of full size. Lorcan Mongey

• **LC10 Printer Driver** – Someone has sent us a FWPlus printer driver for the LC10 (humble apologies, but I've lost track of who sent it in). It is on this month's program disc.

• **Impression II keystrip** – Also from David Crofts and on this month's program disc is an Impression II keystrip which includes many of the new key short-cuts of Impression II.

• **Shinwa CP80 Printer Drivers** – In response to last month's Help!! plea, someone has sent us printer drivers for the CP80 (humble apologies, but I've lost track of who sent it in). On this month's program disc are FWPlus, PipeDream and RISC-OS drivers for the CP80. A

Hints & Tips

• **160k ADFS Discs** (continued from Archive 4.1 p 9) – It is certainly true that the Archimedes can be made to read and write 160k or 320k ADFS discs correctly. I think, however, that the Archimedes 'sees' these as 640k L format discs and if a read or write operation directs it to a track beyond 39 (160k) it will try to push the disc head off the edge of the disc searching for tracks that aren't there. Fine if you know what you're doing. Lorcan Mongey

• **Am I in the desktop?** You can use the Wimp_ReadSysInfo SWI command to see if your program is running in the desktop or not. The command returns the number of active tasks, which will be zero if the program is running outside of the desktop environment. The example program below will sense whether it has been run from the desktop environment and if not, it will start up the desktop before running another application (in this case !Edit).

```
10 REM >startup
20 starcommand$="adfs::Apps1.$.
     !Edit" : REM the application
                        to be run
30 SYS"Wimp_ReadSysInfo",0 TO
                              tasks%
40 IF tasks%=0 THEN starcommand$=
    "Desktop -file "+starcommand$
50 OSCLI(starcommand$)
60 END
```

Adrian Look

• **Apocalypse hints & tips** – If you shoot the green T-shaped buildings with a triangular roof using a mega photon your shield will be replenished. If you shoot a purple and green mushroom, your shield will go into override but your points are decreased for anything you hit with the photons you are allocated. If you shoot a rectangular brown buildings they leave a shallow pyramid and if you shoot this, a Rakon Gomjabba will appear and you will get a few more points for destroying this. If you shoot a Snail Rider with a mega photon, your energy banks are recharged. If you shoot a green mushroom, your score will decrease for everything you hit with the mega photons allocated.

If you type in and run the following program with disc two in drive 0 you will then be able to access all of Apocalyspe's nine worlds.

```
10 REM >All_Worlds
20 REM by P.K.Bedford
30 OSCLI("Dir :Planets.$.
                        !Planets")
40 OSCLI("Copy Hst Hst_Copy
                              ~C~V")
50 file%=OPENUP("Hst")
60 PTR#file%=EXT#file%-5
70 INPUT#file%,world%
80 PRINT "You have so far clear
            ";world%;" planets."
90 PRINT "You can now try your
              hand at all nine."
100 world%=8
110 PTR#file%=EXT#file%-5
120 PRINT#file%,world%
130 CLOSE#file%
```

Paul Bedford

• **Bug in the Debugger Module** – Some of you may be aware of a problem with the Debugger module failing to disassemble certain instructions correctly if they contain an immediate constant. An immediate constant is stored as an eight-bit value with a 4-bit shift applied, and the debugger normally expands this format to its correct value, but occasionally fails, e.g.

```
E28F0C01 ADD R0,PC,#&0100
    correctly expanded
E28F0D01 ADD R0,PC,#&01,26 failed
    to expand (should be #&40)
```

I have disassembled the debugger module and found the offending piece of code. It doesn't seem to be a bug, rather a deliberate move to expand constants differently under certain circumstances but for no obvious reason. Anyway, the fix is to change the word at offset &920 in the module from &1A000028 to &FA000028, effectively changing a BNE to a BNV. This seems to solve the problem, although I haven't tested this fix exhaustively, so proceed with caution. Lorcan Mongey

• ***BUILDing !Run files** – If you write a !Run file using *BUILD and want to include a line such as:

```
Run <Obey$Dir>.!RunImage
```

then, instead, you should type:

```
Run |<Obey$Dir>.!RunImage
```

to prevent RISC-OS from inserting the value of Obey$Dir into the file. It may be obvious but until now I have been using !Edit to write a two line Obey file! Elliott Hughes

• **Copy Options** – "Confirm" and "Verbose" – I think this is probably one of those hints which would be classed as "obvious" by those who know it: The Archimedes User Guide and the PRM both describe, at some length, the use of the system variable Copy$ Options which sets default options for the *Copy command. However, neither make it clear that the desktop filer has its own "Confirm" and "Verbose" options which are quite independent of those which are stored in the system variable. Thus no amount of modification of Copy$Options in boot files or elsewhere will affect the way the desktop behaves.

The filer options can be read and changed by clicking the menu button over any directory window and choosing the Options option. The options selected by this route differ in one significant way from the Copy$Op-tions in that they are stored in battery-backed RAM and thus are preserved when the machine is switched off or reset. They are stored in byte 198 of the CMOS RAM (not byte 195 as my copy of the PRM says) along with various other desktop options:

Bits 0,1		
Filer display mode:	00	large icons
	01	small icons
	10	full information
Bits 2,3		
Filer sorting mode	00	sort by name
	01	sort by type
	10	sort by size
	11	sort by date

Bit 4 Sorting mode (0=name, 1=number) (alpha and numeric sorts?)

Bit 5 Confirm option (1=on)

Bit 6 Verbose option (1=on)

Having these options stored in CMOS RAM can sometimes be an advantage but on the whole I find it rather inconvenient. For instance, I often change temporarily from an icon display to "Full Info" and would like icons to be restored after a reset. Luckily this sort of preference can easily be dealt with by a few lines in the boot routine. For instance, the following lines of BASIC will reset the Display mode to small icons while preserving the other options:

```
SYS "OS_Byte",161,198 TO ,,Old% :
    REM reads the current settings
            into the variable Old%
New% = (Old% AND %11111100) OR
     %00000001 : REM preserves the
              top six bits and sets
               the bottom two to 01
SYS "OS_Byte",161,198 New% : REM
           stores the new settings
```

Hugh Eagle

• **Cut and paste clip board** – Many RISC-OS applications have a 'cut and paste' option. If these applications can also edit more than one document at a time then you can use the 'cut and paste' option as a clip board to transfer data from one document to another. For example, you can select a block of text in one !Edit document, move to another document and then use the <ctrl><c> option to copy the block into that document. This method will also work with applications such a PipeDream but not Ovation or Impression, etc as they use the 'clip board' method. Steve Drain

• **Deskjet Plus Ink Cartridges, Recharging** – You may have discovered the same problem as me when trying to recharge these cartridges, namely that the ink won't go in the hole!

A bit of reverse engineering, with the aid of a hack-saw, has revealed the cause. The container is filled with a dense spongy material which holds the ink, but this does not enter the cavity formed by the raised green portion with the central vent hole. If a syringe needle is entered through this hole it must be long enough to reach into the sponge. At least 20mm is required. If this is not the case then the inserted ink charge is held on top of the sponge by surface tension, and quickly overflows through the charge hole.

The only syringes which I can get hold of are intended for diabetics and have a needle which is too short to reach the sponge through the top hole. The solution is to fill through a second hole, drilled as small as possible, on the 3mm wide land to the side of the raised portion. In this location there is a small internal cavity not filled with sponge. This prevents capillary leakage after recharging.

Archive readers may be interested in the following program which will draw a sketch showing the location of the hole. It should be made as close to the vertical wall of the raised portion as is possible.

```
 10 REM>InkCart
 20 RECTANGLE 500,400,200,300
 30 RECTANGLE 530,420,140,10
 40 RECTANGLE 530,420,140,80
 50 DRAW 530,590
 60 DRAW 550,590
 70 DRAW 600,620
 80 DRAW 650,590
 90 DRAW 670,590
100 DRAW 670,500
110 CIRCLE 600,550,8
120 VDU5:MOVE 672,558:PRINT"+"
120 VDU4
```

With regard to inks I have excellent results with Rotring Art Pen Ink which comes in many colours.
Bill Graham

• **MEMC DMA control register** – With reference to Sean Kelly's tip in June '90 for gaining extra speed from the Archimedes by disabling the VIDC's DMA access. Although the technique normally works without any trouble, occasionally the machine crashes or has its memory contents corrupted. As Sean correctly stated, bit 10 of the MEMC register controls VIDC DMA, however, as the dynamic RAM (DRAM) in the machine is no longer being read by the VIDC it is also no longer being refreshed properly. Bits 8 & 9 of the MEMC come to the rescue, they are the DRAM refresh control bits.

There are three available modes of refresh:-

	bit 8	bit 9
a) No refresh (not used by the Archimedes)	1	0
b) Refresh during video flyback	0	1
c) Continuous refresh	1	1

Flyback time during standard modes (0-16 & 24) is greater than the DRAM holding time and as such requires refresh during flyback. In multi-sync modes the flyback time is much faster and the memory does not need to be refreshed by the MEMC.

The codes for the various modes are:- SYS "OS_UpdateMEMC",768,1792 to turn off the VIDC DMA and invoke continuous refresh and SYS "OS_UpdateMEMC",1536,1792 to return to normal for standard modes.

It should be pointed out that the continuous refresh mode uses the DMA video pointer as the refresh address source, incrementing the pointer after use. As such this should be used with care if the pointer is used as an active part of your program whilst the screen is blanked. (But why would you want to move the pointer if you can't see it??)

There is also a sound DMA control bit in the MEMC but as this does not affect memory refresh bits 8 and 9 which do not need to be altered.

Bit 11 - 0 Sound DMA disable
1 Sound DMA enable

Rob Swain

• **Modifying the RISC-OS dot matrix printer driver** – To add a new dot matrix printer configuration to the RISC-OS printer driver you will need to alter the 'PrData' file in the '!PrinterDM' directory (on your Applications Disc One or RISC-OS Extras Disc = Shareware 17):

1) Make sure you have a made a back up copy.
2) Run the !Edit program on Applications Disc One.
3) Double click on the copy of !PrinterDM that you wish to alter, whilst holding the <shift> key down – a filer window will then open with the contents of the !PrinterDM application inside.
4) Double click on the 'PrData' file in the '!PrinterDM' filer window – a text window will then open.
5) Use the arrow keys to position the caret (red vertical text cursor) just before the 'Configured options' heading and after the row of full stops.
6) Add the following text changing the information to match your printer (the example below adds a Shinwa CP80 / Lucas LX80 option to the RISC-OS printer driver):

```
printer_name:    Shinwa CP80 / Lucas LX80 (170
                                    by 86 dpi)
printer_number:13
pxres:      170  ; dots per inch
pyres:      86
pxres_halftone: 170/4
pyres_halftone: 86/4
dump_depth:    8     ; 8 pin mode
line_prologue:  "<27>L"   ; select appropriate
                                    printer mode
line_epilogue:  "<27>J<20>"    ; move down 20/
                                    180 inch
```

.....

Alan Dawes

• **Nevryon hints & tips** – Nevryon passwords for level three, five and seven are given at the foot of this column, the letters being reversed for the benefit of those who prefer to ignore them.

The following Nevryon cheats allows the ship to be upgraded to have any weapons desired and energy / credits / lives may also be altered.

Load the '!Nevryon.Multi' file on the Nevryon disc 1 and insert the following at line 211.

```
211 Dump=PAGE-&3F800:Dump?n=value
```

where n is:

n=27 : Ship speed, 4 recommended
n=28 : Shield orb (top), 1=ON 0=OFF
n=29 : Shield orb (bottom), 1=ON 0=OFF
n=30 : Ram, 1=ON 0=OFF
n=32 : Gun droids, 0-2
n=33 : Lasers, 0-2
n=35 : Number of credits (default 3)
n=36 : Number of lives (default 4)
n=37 : Starting secondary weapons status, 0=OFF, 1=flamer, etc
n=38 : Gold bar status, 0=OFF, 1=flamer, 2=mines, etc
n=43 : Amount of energy (default 12)

Change as many of these values as you want and save altered program and repeat the process for the $.Multi file on the Nevryon Disc 2.

Jeremy Mears

nnyrK, dragnesI, rodaiM

• **Printing a full path name** – This is a reply to the cry of help in February 1990 from Richard Skemp about how to get the printer driver to include the full pathname. If you add the following line to the Library program in the !PrinterDM directory, the printer driver will print the full file pathname of any text file you print.

```
3281 BPUT#outfile%,CHR$13+CHR$10
       +"Printing file "+filenam$
            +CHR$13+CHR$10+CHR$10
```

Lorcan Mongey

• **Reinstating the filer module** – An item on system variables mentions that if you *RMFaster the filer module from the desktop, you lose the filer icons and can't get them back (Archive 3.11 p 7). To retrieve them, try:

```
<F12>
Desktop
<Return>
```

this doesn't interfere with anything already in the desktop but re-starts any of the default tasks that have been lost, namely Filer, PaletteUtil and TaskManager. Note however, that if you *RMKill or *RMFaster the TaskManager, you can't get a *-prompt by pressing F12! To get around this, make up an Obey file containing the command

```
*Desktop
```

and this will do the trick. It's quite interesting to see the Task and Palette icons in the "wrong" place on the icon bar! However, I feel that you should not deliberately interfere with desktop modules and this method should really be regarded as a 'get-you-home' technique in case of problems. Lorcan Mongey

• **REMming your programs** – When writing a program, in any language, it is good practice to put plenty of comments in to remind oneself what each particular section of code does. However, in BASIC, there are two things which tend to deter one from following this practice. The first is that the interpreter has to recognise a REM statement before it knows to ignore it. This takes time, which may be undesirable in procedures or loops. The second deterrent is the amount of space taken by the text of the comment, which is stored verbatim in the program.

I have a practice, when commenting procedures and functions, of placing explanatory comments outside the procedure/function block. For instance:

```
REM The following function per-
  forms the following calculation:
REM ...
REM input parameters:
REM ...
REM result returned:

DEF FNcalculate_something(param1,
    param2)

.
.
(etc)
.
=result
```

Clearly, the above practice prevents the REM statements from impacting the performance of the procedure/function, as they are in a section of the code which the interpreter will never see.

This last observation leads to an additional possibility for interpreted code (but not for compiled BASIC). Since the interpreter never sees these lines between procedure/function blocks, the normal syntax rules can be broken without an error being generated. Thus, we can save some space, as well as execution time, by omitting the REM key words. Note that this will only work if the comments are where the interpreter cannot see them. If you are in the habit of using GOTO statements (sometimes a handy way of removing umpteen layers of IF... THEN... ELSE statements if you are checking for exceptions and, despite common 'wisdom', still used frequently by professional programmers), this placing of syntactically incorrect code beyond the bounds of a procedure block might allow the trapping of such errors as omitting the ENDPROC or = statements. David Hazel

• **Star LC10** – An undocumented feature on a Star LC 10 Colour printer, is that if you open out a file to the printer and try and print characters 27 and 102 to it, it prints out the current dip switch setting:

```
file%=OPENOUT("printer:")
PRINT#file%,CHR$(127)
PRINT#file%,CHR$(102)
CLOSE#file%
```

Jason Ede

• **System Variables** (continued from 4.1 p9 & 4.1 p10) – I had had similar problems and came up with a different solution which can solve both problems, i.e. reading system variables to BASIC and passing system variables to the Filer module. I use a call to OS_EvaluateExpression, which can return a numeric or string value, as follows:

```
DIM buffer% &100
SYS"OS_EvaluateExpression",
     "SystemVariable",buffer%,&100
                    TO,r1%,length%
IF r1%=0 THEN
  value%=length%
ELSE
 buffer%?length%=&D
 value$=$buffer%
ENDIF
```

This is an artificial example; in practice you would know whether you were expecting a numeric value or a string, such as Obey$Dir. Lorcan Mongey A

Contact Box

• **Bromley Arc Users** – Mr G. Gaunt would be interested to contact any Archimedes users in the Bromley area. Phone 081–462–6009.

• **Club A3000** is an Archimedes user group based in London. For details, send an S.A.E. to Club A3000, 48 Mickleham Down, London N12 7JN. They will be running a "Hands On" computer day at the Bishop Douglas Secondary School, Hamilton Road, East Finchley on 20th January 1991.

• **Olejnik Bernd** would like to hear from anyone in Austria who owns an Archimedes computer. He can be contacted at Pappenheimgasse 31/8/1, 1200 Wien, Austria. A

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Comment Column

• **795 not so nice**? – We have played with a Taxan 795 for a while and agree with Brian Cowan's conclusion that it is a very impressive monitor in terms of the quality of output. However, we did find that it is not as "easy to use" as the Eizo 9060SZ. With the 795, you have to have a VIDC enhancer fitted if you want to use modes 0 to 17. We used it with the enhancer wired in, so that it switches on and off automatically as you change modes. However, there is a large change of height as you go from, say, mode 12 to mode 20 which you have to adjust out and also some games will not work at all. This is presumably because the authors have not stuck to Acorn's software guidelines and are hitting the VIDC directly. So the comparison is between the easy-to-use 9060 at £520 and the better quality, not-so-easy-to-use 795 at £590 plus £35 for the VIDC enhancer.

• **A540 production problems** – As I guessed when I made my comments last month, Acorn are having production problems with the A540. They may make comments about "Due to over-whelming demand" but it doesn't convince me. I ordered two A540's from one of the distributors on the day **before** Acorn told them that they even existed as a product. I have only had one A540 so far (serial nº 38), so either Acorn are deliberately with-holding supplies from the distributor OR the distributor is with-holding stocks from me OR Acorn have hardly produced any A540's other than those sent as review machines or sent to hardware developers (like Atomwide who are proud owners of A540 serial nº 11!).

You may have noted (see below) that Aleph One are having problems with silicon coming from VLSI Technologies not being fast enough and may wonder whether it is this same problem that is causing Acorn a very big headache with the A540's. It seems likely, doesn't it? (The A540 that was delivered to us was sent to a customer and has since failed, exhibiting the same faults that Aleph One mentioned in relation to their ARM3 upgrades.)

• **ArcDFS Review** (cont) – I would like to make a quick comment about Brian Cowan's 'DFS Desktop Filers' article in Archive 4.1. I agree that it would be an advantage for ArcDFS to convert certain BBC load/execution addresses into Archimedes file types when the desktop filer is being used. However, this cannot be done wholesale since one of ArcDFS's features is its usability under the BBC emulators, which require the original load/exec addresses to be used.

I will be looking into the above matter and that of unwanted icon-bar drive icons which has already been brought to my attention. Richard Averill, Carshalton.

• **ARM3 speed problems** – Some of the latest batches of ARM3 chips from VLSI Technologies are not able to run reliably at 30 MHz. This is affecting some of Aleph One's ARM3 upgrades and, presumably, those from other suppliers, though they have not told us about it. If you think you may have problems, talk to Aleph One about it. They have said that they will either give you a full refund or will downgrade your chip's clock to 24 MHz (which act-ually only makes about 12% difference to the overall speed of the machine which is not much given that the ARM3 multiplies the speed by something like 3 times) and then upgrade it again when they can replace the chip with a new higher speed chip. Now that's what I call good service to the customers. It will be interesting to see if CJE and Watford have the same policy. (Watch this space for cheap 24 MHz ARM3 upgrades when the 30 MHz chips are available.)

(CJ Micros and Watford Electronics say that they have not had any problems as yet and Watford say that they have such big stocks of ARM3 chips that they are not worried about the problem.)

• **CC commended** – When I had trouble with a Laser Direct printer, Computer Concepts' service was excellent. They replaced it extremely quickly and even said they would pay the carriage costs (though I actually decided to take it in to them myself). Well done CC! Tim Powys-Lybbe, Windsor.

• **Cheapo multi-sync**. I have recently purchased an AOC CM326 (available at your local cheapo PC dealer for £289 +VAT). It is 0.28mm dot pitch, 14 inch with a 40 MHz bandwidth. It works in all modes (0 – 21 and 24 – 28) with an excellent display but it

gives a square display in modes 18 – 21. This can, however, be corrected by using Andrew Ling's VIDCnec module (on Shareware 24). Stuart Allison, Ealing.

• **Dealer problems** – Some months ago, I needed to get hold of a copy of the Acorn ANSI C compiler at very short notice (i.e. the same day). This meant that my usual source for such things (i.e. NCS) was unfortunately out of the question. I therefore got out my list of Acorn official stockists (sent to me by Acorn themselves). Imagine my dismay when I had to go down a very large number of possible dealers in my area before I found one which had the software in stock! Many of the dealers were either only hardware suppliers/fixers; others only stocked games; one hadn't a clue what I was on about and eventually I put the phone down after a second person disappeared for ages to find someone who could answer my question. After finding one which could get hold of a copy the next day ("If we kept all of our goods in stock, we would go bust"), I eventually telephoned a dealer in Leicester (30 miles from where I live, but fortunately quick to get to). They had it in stock!

My point in relating all this is as follows: In the highly competitive sector of the computer market which Acorn have chosen to target their machines, I find it staggeringly naive of them not to have lots and lots of very professional dealers. They are competing directly against: IBM, ICL, Compaq, Tandon and Amstrad in the PC market; Sun Microsystems, HP-Apollo, DEC, IBM, and ICL in the RISC-Unix workstation market; Commodore and Sinclair (& Amstrad) in the home market – and those are just the manufactures I can remember of the top of my head! Unless Acorn can offer exactly the same level of professionalism as these companies through their dealers, they don't stand a chance, frankly. Since Acorn have decided that they will only deal through third parties, they are totally dependent on the level of professionalism shown to their customers by these third parties. One would expect, therefore, that they would choose their dealers with great care and an eye to the image they will present of Acorn itself.

I am a professional consultant and I have been involved in many aspects of the 'high technology industry' for over seven years. I currently work as a freelance programmer for one of the companies mentioned above, where I overhear much of the way in which that company sells its products to prospective clients. Granted that this particular company has a worldwide reputation to back it up, it still has to put over a very professional attitude to it prospective clients. It may be said that the way in which a company begins to get a worldwide reputation is by being seen to be professional. There is a poster in the office where I work which list the reasons why customers change their suppliers. By far the largest percentage (68%) change because they perceive an indifferent attitude from a representitive of a supplier, Acorn would do well to consider this when they select their dealers. They might also give serious consideration to providing support directly themselves as a 'first point of contact', instead of as a 'last resort'. Note the alternative connotations of these two approaches.

My opinion of Acorn's products is second only to my opinion of the company for which I presently work. Their standard of engineering (in the correct sense of the term) is very high. However, my opinion of their marketing and customer support is lower than that for most other computer companies. They would do well to remember that since the buy out of ICL and Apricot by Japanese interests, they are one of the only indigenous computer manufactures left in this country. Unless they change their marketing approach, that might well change. David Hazel, Nottingham

• **DeskJet Plus** – Arrgh! I'm very annoyed, but hope that the cause of my annoyance may help other Archive readers. In August, I scoured the adverts in PCW for the best price for a Hewlett Packard DeskJet Plus printer and paid £499 plus VAT. Now I find them widely advertised at £350 plus VAT! It may be because it's being replaced by the DJ 500, but whatever the reason, it must be an excellent buy for budget DTP work – see review in October's PCW printer supplement. Stuart Bell

• **Desktop Office** – The Archimedes A3000 is my family's first computer – we are all very new to it. One of the biggest problems we have, apart from the jargon used, is that all the software/hardware/games/magazines, etc seem to be aimed at people who are familiar with computers. We have been to some of

the exhibitions to learn more but, whilst we have found the sales people very helpful, we have often felt pushed aside by people wanting to talk about computers for the sake of it (we think that they are in fact showing off and trying to out-do each other).

Anyway, we run our own business from home and felt that the A3000 could assist us with letter writing, accounts, database, etc. Before DTO came along, we had looked at Pipedream and other applications and felt that, whilst they were no doubt very good, they were far too complicated for our use. Presumably, they cater for all uses – therefore there would be a large proportion of the product that we would be paying for but not actually going to use.

We purchased a copy of DTO at the last Acorn exhibition and are very pleased with it. The manual is straight-forward, logical and easy to follow; the software is easy to use; and in fact the disc has just been upgraded by return of post and free of charge! Our only problem is using the software and Clares' driver to print-out on our HP Paintjet – I am waiting to hear from Minerva about that one.

Congratulations to Minerva then for a package that can easily be understood by first time users, something which we feel is often overlooked by others. Certainly, when one is working for oneself, from home, without a great deal of spare time, sitting down for hours and hours trying to fathom out recently bought software is just not practical.

By the way, I am still waiting to read articles in Archive which are aimed specifically at newcomers. Graham Jones, Fleet.

• **Econet Column** – I have been both a user and a manager on an Econet system for some time now – I have encountered many problems along the way which have mostly had to be fixed either by myself or by one of my compatriots. None of the major magazines has a permanent Econet Column related to the BBC or the Archimedes computers and so I felt that it was about time there was. As the potential editor of such a column, I obviously need some sort of basis to start the column which means you, the reader, sending in any information or problems or whatever, regarding Econet. The column would obviously not be much good if there were no user feed back. Any problems which you have, managerial or otherwise, I will try to help with, and put in the next month's column with an answer. If I cannot answer the problem, I will put it in none the less, to see if anyone else can help. Contributions may be sent to me direct:- Neil Berry, 21 Pargeter street, Stourbridge, West Midlands DY8 1AU (no phone calls please!). I presume that there is a need for such a column but if I receive no feedback, I will assume that such a column is not required.

• **Interdictor II** – I think Interdictor I must have been a practice because this version is far more playable and seems to build on the basic ideas in the first. I quite liked the first Interdictor, but II has much better graphics detail with improved lighting and shading effects. There are also many more objects such as a ship in a lake, trees at the end of the runway and a motorway with moving traffic. It may be that I have got better with practice but I am also finding II easier to fly with more control when not in Auto mode and a realistic chance to dog-fight with what at times seems a plethora of enemies. Transport planes dropping cargo on parachutes which are quite realistic and flames from the exhausts of rockets all add to the fun. Another highly recommended application. One can only wonder what an optimised flight simulator for a 540 running SVGA and with the scope to exploit a full 16 Megs of memory would be like! Ian Lynch

Martin Coulson of Atomwide tells me that Interdictor II on a 540 with the cache ON is almost unplayable! Ed.

Interdictor II versus Chocks Away – Gareth Roberts, aged 14, has given us his thoughts regarding these two new flight simulators.

Interdictor II – I would recommend this game because you are totally free to go where you want and do what you want. The graphics are very good at long and short ranges. The possibilities of what you can do are excellent – four different types of radar, three types of weaponry and many other versatile gadgets.

This game is best played using a joystick and pressing <ctrl-J>. A few tips – never disturb an enemy base which has a lot of planes there. These planes will tail you throughout the game and nearly always shoot you down in the end. Wait for planes to come to you and always have sidewinder missiles on, use the 5 km radar (it's easier to use) and use the cameras for seeing where the planes are. Compared to Chocks

Away this game is a bit harder to handle and is suited to a more serious attitude to a flight simulator because of the nearness to a real plane.

Chocks Away – This game is more fun in some ways because it is easier to handle in the air. It takes a lot of hits for you to be shot down and the plane can be regained from a dive or a spin. However, the graphics are not as good as Interdictor II and the absence of the H.U.D., altimeter and roll bar make it hard to see where you are in comparison to the ground.

Overall, I think Interdictor II is the better game of the two because of its versatility and because it is serious and yet fun to play. Gareth Roberts, Maidenhead.

We have a friend who is a fighter pilot flying Tornados for the R.A.F. Although he had never even heard of the Archimedes computer, we got him to come and try out Interdictor II. (Chocks Away wasn't available at that stage). Once we realised that you had to press <ctrl-J> to get it to respond properly with the Voltmace joystick, he was in his element. It was absolutely stunning to see someone who knew what he was doing, flying Interdictor. It was amazing watching him loop and roll etc to shake an enemy plane off his tail and then getting behind him before blasting him out of the sky. Ed.

• **Library of routines and algorithms** – Why not have a monthly column with various short routines or algorithms sent in by the readers? You could cater for all languages. Here is a short description of the ANSI C function pow() which could be used as the standard:

Function name: pow
Language: ANSI C
Prototype: double pow(double base, double exp)
Description: pow returns 'base' to the power 'exp'
Listing: etc
Author: Elliott Hughes (aged 15)

Good idea, Elliott, but I think we would need someone with experience of a good number of languages to edit the column. Any offers? Ed.

• **Open University** – Anyone thinking of doing O.U. courses may have noticed that an Archimedes with a PC emulator is now recognised as approved kit. However, let me say from experience that it isn't that easy. The Archimedes may be 'the best thing on 32-bits' but when it comes to running Pascal on the p-system or trying to get GEM to do all its tricks, things are far from perfect. (For the uninformed, O.U. is where you get up in the middle of the night to watch TV programs presented by people in flares.) Jon Wetherell, Rayleigh.

• **Ovation** – I have been using this program for three months now and I must say that I do like it. After my trials with the first version of Impression, Ovation was a joy. It was in a far more complete state than I think Impression 1 ever got to, judging from the press and the bulletin boards. However, Ovation does have its quirks and I would have expected the promised hyphenation and spelling extensions by now. Impression II has a long list of 'improvements', some of which are no more than bug fixes from the first version and others appear to be 'copied' from Ovation. Anyway, it now looks a very good package. I only hope Beebug follow a flexible upgrading policy for Ovation as it may still have the edge for price. Steve Drain.

• **PipeDream come true?** – We have recently transferred all our accounts from InterSheet on a BBC Master onto PipeDream 3 on the Archimedes. (Many thanks to Rob Macmillan for all his help in getting it working!)

What Gerald Fitton wrote in Archive 3.10 p31 about 'easy-to-learn' and 'easy-to-use' is, in my view, very true. PipeDream is difficult to get into in many ways but once you have got through the initial barriers, it is incredibly powerful. I was wondering at one stage whether the rather long PipeLine articles were justified but having used PipeDream a bit now, I am sold! Keep it coming, Gerald! Ed.

• **Poster update** – 4mation's Poster is now available in an improved version 1.04. No new functions have been added but all known bugs have been fixed. There is a more solid feel now, fewer crashes and it has stopped bringing Impression down with it.

Existing registered owners should have received a free upgrade offer through the post. If you haven't, contact 4mation to ask them why not? John Schild.

• **Rhapsody** – It is quick to use and has lots of key short-cuts if mouse operation becomes a little ponderous. There are still one or two 'features' which have to be ironed out but it is a very useful tool for transcribing and/or replaying music including

doing transpositions and printing out individual parts as well as multiple staves.

It imports Maestro files and then treats them as its own. There are a few problems with note and tail alignment but these don't usually take long to edit out.

Some nice features are included, of which 'Shift' is the most fascinating. When moving parts around between voices or instruments, it may be necessary to put them in a different clef but in the same key. 'Shift' moves the notes up and down without changing the key as would happen with 'Transpose'. Neat! David Crofts, Bury St Edmunds.

We have been playing with Rhapsody too and are equally impressed. We have set up the keyboard player at our church with an A3000 system and a Midi podule and he is very rapidly committing all his own musical compositions to paper (well computer as he hasn't got a printer!). He has never used an Archimedes in his life before but soon the church's music group will be able to work from laser-printed scores instead of Neil's hand-written ones.

The only problem we have had so far is that if you try to print Rhapsody scores onto a Laser Direct, you get blank sheets of paper! We reckon that the problem lies with CC's printer driver because we have been able to print them out on the Apple Mac's Laserwriter NTII with the PostScript driver with no problems. CC are looking into the problem. Ed.

• **Rhapsody** – This software is excellent value for money and solves most of the short-comings of Maestro. Files produced in Maestro can be loaded and extra facilities such as additional control over voices and loudness can be added in order to produce more expression and feeling into the piece. The additional voices supplied with Rhapsody are excellent. Editing is much more straight-forward and there is far more control over the positioning of notes, copying and the types of notes used than in Maestro. Musical notation and composition are usually not taught until GCSE owing to the rather abstract relationships between sight-reading and the psychomotor skills required to play an instrument. With Rhapsody there is no reason why much younger children should not experiment with notational composition, being actually able to hear what they have written. This is, of course, also the case for Maestro but Rhapsody makes things easier and therefore more accessible as well as providing for the more knowledgeable composer. I learnt to write four part harmony at school before playing an instrument and I composed several "master pieces" which were technically correct but I never heard played! It is true that computer music still has not got the flexibility that a human has when playing an instrument but as a teaching and learning tool, software such as Rhapsody is an absolute must. Schools that teach music and home users who want to learn (or teach youngsters) about musical notation and how to compose music, will find this software indispensable. Ian Lynch

• **Storage ideas** – I use my computer to help me run my own business (a software consultancy), as well as for my personal use. I have a 47M disk, which would require something in the region of 61 floppies to back up (assuming that every floppy could be crammed full with parts of the backup, which is doubtful, and that such a quantity of floppies could be stored more securely than the computer with the hard disk, which is even more doubtful).

I have been looking around recently for a tape streamer and am horrified by the prices. It is cheaper to buy a second hard disk and use it solely for backing up the main one! I can't believe that tape streamer technology is so much more complex than hard disk technology that it costs twice as much as to manufacture. In fact, I don't believe it is more complex at all. A video recorder is capable of recording the correct quantity of data on a standard video cassette. (I know it is, because one tape streamer I saw used at a company where I once worked used a standard Video-8 tape to hold 2 **Giga**bytes of data for backing up hard disks).

So come on, you tape streamer manufactures. Stop charging the Earth for something which can be done by a device costing half the price (i.e. another hard disk, or a video recorder)! I would concede that since it is less aimed at the home user, one might expect a lower volume of sales, and hence a higher price, than hard disks themselves but twice the price is a bit hard to swallow, especially given the ready availability of video recorder technology. Doesn't anyone in the personal computer market believe in stimulating market demand by offering a lower prices? David Hazel, Nottingham

How about using a 42M SCSI removable drive as a back-up medium? If you already have a SCSI hard drive then, at £680, it is a very cheap and fast way of backing up. Even if you have an ST506 drive, £870 for a SCSI podule and drive is not that expensive and you have the SCSI podule ready for other add-ons you might want later. Also, it gives you the same kind of security of backup as a tape-streamer in that the cartridge(s) can be taken to a different building and/or be locked away which is not really practicable if you are using a second non-removable hard drive for backup. I know we are trying to sell these new removable drives and, yes, we do make money by selling them, but we are convinced that they are a very good buy. Ed.

• **Too many outline fonts**? Many application, that are available for the Archimedes use outline fonts but the proliferation of these fonts has revealed that some these programs (e.g. !Edit or !Draw) did not anticipate this, which results in the programs crashing as they are unable to create menus large enough to display all the fonts that are available.

This effectively means that the outline fonts must be 'hidden' from the offending application if it is to be run. Several methods for doing this have been proposed, the simplest being that the !Fonts folder should be moved from the root directory into another directory and so can be called up only when needed. Another method suggests that the !Run file of the offending application be edited to include a *Unset <Font$Prefix> command, which will make the Font Manager forget all the fonts it has seen. (This will of course mean that if the fonts are need by another application the !Fonts folder will have to be double-clicked again). In any event, hiding the fonts from the application may be self defeating e.g. what is the point of !FontFX without any fonts?

I propose that an application should be written that allows the user easily to control which fonts are available and which are not. This would allow you to determine exactly which and how many fonts an application knows about.

My solution is to create two directories in the !Fonts folder a 'used' directory and an 'unused' directory. The Font Manager being set up so that it can only see the 'used' directory. As the fonts can easily be moved between the two directories using the *Rename command, an application can be written that will allow the user to control which fonts are available when an application is run and so control which fonts a particular application can see. Adrian Look.

The program has been put on this month's program disc because the listing is too long to put into the magazine. Ed.

What price the A540? – The A540 is a really good computer, fast, easy to use, expandable, etc. The only problem is the price, which is too high. I know that Acorn has to make a good profit so that it can expand and produce further enhancements. Even so, the component and manufacturing costs can only be about £1300 (ARM3 chipset = £200, 4M RAM = £200, SCSI + 100M drive = £600?, miscellaneous = £300). A retail price of somewhere around £2500 would be more appropriate. An expanded A410 with an almost equivalent specification would cost only £2860, why pay £600 more for an A540. Mind you as there are so few being made at the moment their rarity should increase their value!

Although the A540 is good, I think it could be better. Firstly the memory is still relatively slow at 6/12 MHz. I think that it could be increased to 8/16MHz without much difficulty. Also, a faster hard disc could be provided, 25ms is not really very fast. These enhancements would increase its apparent speed by 30% putting it up to the equivalent SPARC based micro speeds. Most fast PC compatibles use an external cache (up to 128K), an equivalent Archimedes with an external cache could appear to have at least double the speed of memory and would make 50 or 60 Mhz ARM3 processor operation possible (this assumes the fast enough ARM3 and MEMC are available). This would give a speed of about 30 MIPS, faster than any general purpose single processor micro.

An obvious enhancement to the ARM chipset would be better MEMC and VIDC chips. A VIDC giving 32 bit colour and 1280 by 1024 pixels and making use of video DRAM (VDRAM) together with a MEMC which can access 16 or 32 M and also control VDRAM for the VIDC. The MEMC should be able to control fast DRAM without putting in too much delay. A 60ns RAS 20nS CAS access DRAM should have no more than 40ns/30ns delay added for a 10/20MHz memory system, this would give a

64MByte/s system bandwidth (A400 gives 24M Byte/s and A500 36MByte/s) with no bandwidth lost because of screen refresh. The MEMC would also have facilities for external caches of very fast RAM, 15ns RAM is available now and soon 5ns RAM will be available. With a reasonable size cache of say 128K where most accesses would hit the cache a system bandwidth of 400 MHz might be possible. This would enable a 300 MHz (!!!!!) ARM3 (or ARM4 or ARM5) to reach 150MIPS.

I can't see why Acorn are producing a Floating Point Accelerator (FPA). If they can create the FPA, they can put the same circuits on an ARM4. As the ARM4 should not be much more expensive (if at all) than the FPA but should be much faster at floating point and be ready not much later, the ARM4 should be the one to concentrate on. The ARM4 will have a much wider market, I doubt whether more than a few hundred FPA's would be sold.

What Archimedes micros are available? – The micro market can be divided into several categories: games, home/hobby, business, workstation, portable, laptop, fileserver and industrial. So far, the Archimedes range covers home/hobby, business and workstation, but the low end games machine, the high end fileserver and portable, laptop and industrial categories are not catered for. There are also no Archimedes clones – clones have been one of the things that have made the IBM PC such a success, giving the user a wide range of machines at a very competitive price. Because Acorn control the operating system, Archimedes' clones can never be produced without Acorn's approval. Would Acorn licence the ROMs to companies either competing directly with them or filling gaps in the market not in direct competition with Acorn products? What about their attitude to selling Archimedes motherboards for OEM use? Mike Atkinson, Harlow. A

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Getting the ideA

At last Ian Copestake Software is ready to accept orders for the first products in the *ideA* range.

For those who haven't heard, the *ideA* is a brand new hard disc interface for Archimedes and A3000 computers. 'IDE' stands for Integrated Drive Electronics. As the name suggests IDE hard discs have sophisticated electronics built into them, allowing the computer interface to be simpler, cheaper and more reliable. Transfer and access speeds can also be enhanced.

IDE discs are auto-parking, and some have the ability to switch themselves off to save power during periods of inactivity.

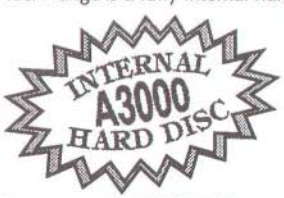
Now for the first time we can offer Archimedes users products previously available only in the PC world.

Although the *ideA* is new, you can use it just like the familiar ADFS. All properly written software will work as usual and there is no conflict of *ideA*s with existing ADFS or SCSI drives.

Fitting a hard disc in an A300/400 series computer is straightforward and clear instructions are provided. All discs supplied by us are tested and formatted. The complete upgrade kit includes a disc cradle and fan, and is called for example **IDEARCIN40**. The 40 at the end indicates the hard disc capacity: the sizes available are shown below (others will be added by the time you read this).

A backplane is not needed on the A310 unless you wish to connect other podules. In that case you must use a high-quality four-layer backplane such as the one we offer.

One of the most exciting products in the *ideA* range is a fully internal hard disc upgrade for the BBC A3000. Just the job for schools and any location where space is restricted or security is important. The **IDEA3IN20** uses one of the latest 2½" 20 megabyte low-power discs. We cannot be sure yet whether larger capacities will become available for internal fitting.



Although installing the A3000 upgrade is quite easy, it could be dangerous for inexperienced users to open the computer. We have therefore priced this upgrade to include collection, fitting and delivery at our service centre. (Please make sure we have your daytime and evening telephone number so we can arrange this).

Ian Copestake Software will be producing a range of other accessories for the A3000. First to arrive is **IC PLINTH**, a steel monitor stand to which you can later add **IC HOUSE**, our hard and floppy disc drive housing (ready very soon). The Plinth can take a variety of 14" monitors yet occupies less than 18" from front to back when in use. It has anti-slip feet and may be fixed to a desk. Assembly is easy. There is full access to the mains switch and floppy disc drive, while the reset switch is accessible but guarded.

The *ideA* hard disc controller is also available on its own for those who are confident of choosing a suitable IDE hard disc themselves. The product reference is **IDEARC**. We must point out that we can accept no responsibility for the performance of the *ideA* interface with discs we have not tested.

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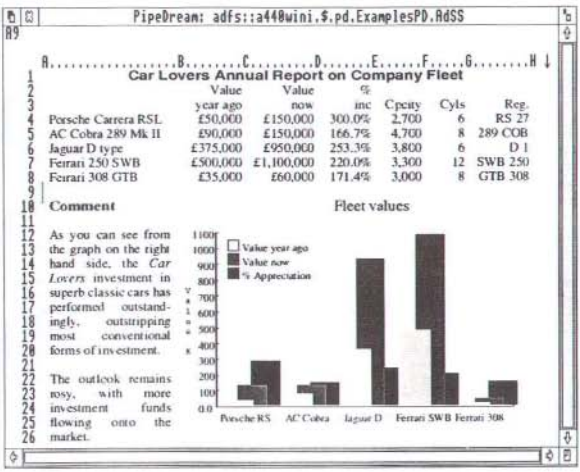
Ian Copestake Software

PIPEDREAM 3



PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. You can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

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Fax: 0954 211607 Tel: 0954 211472

All trademarks acknowledged. The chart in the screen shown above was produced by sending numbers from PipeDream 3 to Lingenuity's Presenter 2 and then loading the resulting graph back into PipeDream 3.

Colton Software, Broadway House, 149-151 St. Neots Road, Hardwick, Cambridge, CB3 7QJ, England.

Fax. 0954 211607 Tel. 0954 211472

Choosing a database

John Schild

Beginners start here

"Pick a point in the future. Research how your context will have changed. Pinpoint the needs and opportunities that will arise."

That advice, voiced by John Cleese in a management training video, should be taken seriously by any Archimedes user planning to buy one of the database management programs now beginning to show up in the software catalogues. It seems like the right moment to offer a beginner's guide to help potential buyers pick their way through a forest of unfamiliar jargon and potentially misleading claims.

Strictly speaking a database is any collection of data. The floppy disc and shiny manual you buy is a database management system (DBMS). The complexity of that system can vary enormously and you should not assume that any DBMS in any price range is going to have the same functions as all the others. Historically, databases for home micros began as simple electronic card index systems. A collection of data on the same subject is called a "file" – it might be "CD collection". The data on one item, say, Mozart Symphony No 41, is a "record" which is in turn divided into "field"s: Composer, Opus No, Orchestra, price, etc.

The simplest DBMS would allow record cards to be created, consisting of fields, either "string", i.e. any alphanumeric characters, or "numeric" such as cost, on which calculations can be made by the program. Some allow additional types such as "date", and new options are coming on stream all the time, for example, sound and pictures. Once the card is created, it can be saved to disc; data can be entered, edited and deleted. The records in a file can be displayed on the screen one at a time and manipulated in various ways according to the sophistication of the DBMS.

Searching and sorting

Once your database has grown beyond a few records, searching for an entry can be very tedious, so all DBMS programs offer some help. "Sorting" allows the records to be presented in alphabetical (or it could of course be numeric or date) order of a chosen field. That would enable you to skip quickly through to the M's to find Mozart. But suppose you knew you were looking for a CD recorded by the City of Birmingham Symphony Orchestra but you couldn't remember which it was. Your DBMS will once more come to your aid by allowing you to search the "Orchestra" field for the required entry. You have to be careful here; use the right kind of search, and do not try to exceed the search capabilities of the program. A database I used to run would have failed to find my favourite orchestra if I used capitals to type in the search string but had entered the data in lower case. It can be very frustrating! With hindsight, I would always enter the data and the search string in a strict common form.

Most DM systems allow different kinds of search, using criteria like "equals", "greater than", "less than" or "string anywhere in field". Other enhancements are the logical operators AND, OR, used to link fields. Using an AND search, I could find a CBSO recording conducted by Simon Rattle but passing over recordings made under other maestros.

Many DBMS programs allow searched out records to be saved as subsets, so that if you wanted to work purely on Beethoven conducted by Colin Davis, you wouldn't always have to have the whole database displayed.

Soundex or fuzzy search facilities can be useful particularly if your database carries a lot of surnames and you are not always sure of the spelling. But beware, all are not built around the same algorithm and are not equally effective.

Key fields and indices

Further refinement is offered by some DBMS programs in the form of key fields and indices. A key field is one on which quick searches can be performed. Better programs provide for several key fields but they often have to be defined before they can be used. In my CD file, if composer were a key field, I could type in something like ~MOZ<return> and it would take me to the first Mozart record it could find, then – if instructed – go on to the next, and so on.

Indices are also very useful. Think for a moment of a computerised library catalogue. Suppose that you

want to find all the books by Joe Smith but you can't remember any titles, or you want to find a book called Data Base Management Systems but you don't know the author. Many systems now allow several fields to carry an index, allowing the records to be displayed in different orders, according to which index is operative. If the author index were operative, all Joe Smith's output would be grouped together and if the title index were in operation, all the titles beginning with Data Base would be grouped.

Another useful facility sometimes on offer is the capacity to toggle the display between "card" (only one on the screen at a time, but all fields in view) and "spreadsheet" – perhaps 30 or more records on screen at a time but not necessarily all fields at once (but they can usually be scrolled). Useful and often quicker if you are not quite sure what you are looking for.

Import/export

A friend keeps my church membership records (I'm a Rev.!) up to date using PC File+ (a very nice bit of shareware) on her Amstrad. I keep a copy hiding under the PC emulator on my Archimedes but it is not very useful when, for example, I am writing a letter on a native mode word processor and want to pick up some data from behind the PC partition on my hard disc. PC file+ will export, !PCdir will convert, but to obtain the maximum benefit, I still need a multi-tasking native mode Archimedes database that will import and then export to another database, word processor or charts package.

Scripts and macros

Scripts and macros are basically time saving facilities. If the database is used regularly for the same operation, such as a month-end report or an end of session back-up to a floppy disc, it can be very time consuming carrying out the same set of key strokes every time. Many DBMS programs allow a sequence of key strokes to be recorded as scripts or macros and replayed when needed. The terms are occasionally used interchangeably; if there is a distinction, it is that scripts are generally simple sequences of keystrokes, whereas macros can be rather more advanced. Some DBMS's allow the user to write a macro that will (for example) ripple through a whole file increasing the price of every item in the price field by 12%, rounding the result to 2 decimal places. I've just worked out a macro to add a 3 to all the phone numbers in town which, at present, begin with a 5!

Transfer

No one gets their database right first time. There is always a field you don't realise you need until you have a hundred records and whereas you thought you would only need space for 200 records, you now need 400. All serious DBMS's offer a transfer facility allowing a new bigger file to be created and all the records popped in.

Password protection

Multi-user systems often carry information essential to one user, but too sensitive for all eyes! Some systems offer password protection, allowing each user a unique password to gain access only to those fields which the system manager deems good for him!

Reports

"Reports" is the software jargon for printed (or saved to disc for exporting) output from a database. Most DBMS's provide a variety of reporting options but they are not always the same and they are not all equally useful. Any serious program will have a "default" report format which lists the contents of all fields (up to printer width) across the page, adds up the contents of all numeric fields and prints the totals at the bottom. Variations on this basic theme would be the ability to work from sub-sets, omit some fields and vary field order, add headers, print page numbers and sub-totals. Very useful if that is what you want – am I alone in almost never finding the default report generator useful?

A facility not always included, but in my view indispensable to a serious system, is the ability to generate "custom reports". This simply means that you can generate and store your own report forms, including standing text, field contents, results of calculations, etc. anywhere on the page. These can be printed from each record, for example as customer accounts. If you like, you can think of that much abused concept of mail-merge as a sub-set of custom reports.

Another must is address labels – equally useful for the customer accounts and the Christmas card list.

Application programs and languages

Because users' needs vary so widely, some DBMS's, rather than offering comprehensive custom report

facilities, market alternative front ends driving the same database but with a very specific application (such as customer accounts) in mind. These will often be written in a programming language which the DBMS core understands. Reference manuals can often be purchased, and experienced programmers can write their own applications. However, be sure the producer will support the programming language. *(MultiStore is one notable example of this. Ed.)*

And finally...

Do be aware of the Data Protection Act. If a computer database contains any personal details of any customer, client, club member or whatever, it must by law be registered under the Data Protection Act, even if it is held by a body as innocent as the local Darts Club. The only exception allowed by law is a simple distribution list for something like a church magazine. If you add a field for date of birth or whatever, it has to be registered. Main Post Offices keep registration forms.

Relational Databases

Some confusion has started to arise about the use of the term "relational" to describe some of the DBMS's now entering the home computer market. It is a complex situation, impossible to unravel in a few words, but I feel that something needs to be said for the benefit of potential purchasers of the new generation of DBMS packages for the Archimedes. It will be necessary to begin with some history and also make a brief excursion into the foothills of mathematical theory. *(This is not a journey for the faint-hearted. Ed.)*

In the late 1960's, before the introduction of the microcomputer, most databases were held on mainframes using a variety of ad-hoc data structures. A mathematician working for IBM, Edgar Codd, set out to bring some order into this chaotic situation by working out a mathematical model for a DBMS – an abstract model employing logical, not physical, structures. Codd later teamed up with Chris Date, and the development of Codd's early work still goes on.

The Codd & Date model

In this mathematical model data is presented in logical 2-dimensional tables, referred to as *relations*. Relations have columns, called *attributes*, and rows, called *tuples* (to rhyme with couples). Every attribute has a unique name and may hold data, identified as a *value*. All values taken by an attribute must be of the same type, such as an alphabetical string, or a numeric value. Attributes cannot take multiple values or a mixture of data types. That is, they must be defined under a common *domain*. Each tuple must be unique – at least one attribute (or combination of attributes) in the relation must contain a non-repeating value (or values). For example, in a list of employees, it could be Staff Nº (because two or more staff members might be called John Smith but would not have the same staff number).

Keys and relationships

Every relation has a *primary key*. This may be one attribute, or several, or it could even be all the attributes in the relation. It is defined by uniqueness and minimality. In the above example, Staff Nº would be the primary key, because its value does not repeat in the extension of the attribute. Some relations might require the inclusion of additional attributes to constitute a primary key because a single attribute does not meet the uniqueness rule. However, you can't just add attributes at random to define the primary key. It must be minimal, containing only the necessary attributes.

Two relations are said to be in relationship if they have a common attribute. If one relation has a primary key of a single attribute and references a composite attribute (the foreign key) in a second relation, the degree of the relationship is said to be 1:n. Codd and Date further define alternate keys and candidate keys, but I think I have wandered far enough into the algebraic foothills to meet our present need.

When a set of relations exists in conformity to this logical structure, they may be acted upon by a set of algebraic operators. For the record, I will name them but I will not attempt to describe them because they are well beyond the scope of this non-expert article. They are: select, project, join, divide, union, intersection and difference. When one or more of these operators is made to act on a relation or a set of relations, it produces a new relation which is a subset of the relations on which the operation has been performed.

An elegant feature of this model is that it is capable (within limits) of being transferred from the abstract world of algebra to the real world of computer software. Edgar Codd drew up a table of 13 rules of fidelity to which he hoped that any real world computer program would conform. An integral part of the concept is that the relational operators of the theoretical model translate into a "structured query language" (SQL) through which the database may be interrogated.

Interestingly enough, the only part of Codd's great construct to have reached the point in development where it is recognised as an industry standard is SQL, which is now accepted as an ANSI and ISO standard.

I understand that no existing relational DBM system yet conforms to all the rules of fidelity. However, the gap is narrowing, and IBM's own mainframe DB2, along with RDB, Oracle, Ingres and a number of PC products such as Dbase IV, DataEase and Paradox offer a useful degree of conformity.

Functional resemblance

Presumably because no licensing laws or conventions yet exist to limit the use of the term "relational" to DBMS's which conform to the Codd & Date theoretical model, software houses are able to market products which bear a functional resemblance to the "true" RDBMS but which lack structural conformity. Such a DBMS might, for example, allow the linking of a single field in two files but fall short of the performance offered by a "true" relational DBMS by merit of its 1:n linking possibilities.

Perhaps the heart of the current confusion is that while many purchasers might find this limited linkage function sufficient for their needs, there will always be those whose familiarity with the Codd and Date theoretical model will lead them to believe that any database claimed to be relational will possess the expected structural integrity and the performance which goes with it. If they purchase a DBMS on the basis of a software house's specification alone, the lack of nomenclature convention might well leave the purchaser morally outraged but without legal recourse.

Perhaps someone with far greater experience and competence than I possess might be willing to draw up a set of performance criteria for database management systems claimed to be relational, offering potential purchasers some objective benchmarks by which to judge the products now on offer. Test results could be published in Archive.

In the meanwhile, the only advice which can be given is "buyer beware". Pester the marketing people with hard questions and try to get some hands-on experience before taking the plunge. If you must have a true RDBMS and are completely stuck, I believe Paradox is available for pre-purchase inspection and runs beautifully under the PC emulator. A

Competition Corner

Colin Singleton

The seven dwarfs, impatiently waiting for Snow White, are playing a form of musical chairs. No, don't go away. This really is the Archive Prize Competition!

They sit around a circular table on seven chairs, each bearing the name of a dwarf. When they come in from work, they sit at random on the chairs – then each attempts to reach his own chair by a series of moves.

A legitimate move consists of two dwarfs changing places. They may do so subject to two conditions. Firstly, the chairs belonging to the two must be adjacent. Secondly, the chairs currently occupied by the two must not be adjacent. Observant readers will realise that this game could last a long time.

There are 7! = 5040 possible seating arrangements, which fall into a number of groups. Any arrangement can be transformed into any other arrangement in the same group, by a series of one or more exchanges but cannot be transformed into any arrangement in another group.

How many groups of seating arrangements are there, and how many arrangements are there in each group?

If that is too easy, try again, after recruiting one or two more dwarfs.

Entries and comments please either via N.C.S. or direct to me at 41 St Quentin Drive, Sheffield S17 4PN. *(If you have other ideas for competitions and/ or would be prepared to set one, I'm sure Colin would be pleased to hear from you! Ed.)*

And now, at last, the result of the Cities' Wordsquare Competition from June. Run times varied from seconds to hours. 'Missing' words varied from one to ten. Interestingly, the most successful was also the fastest. Keith Miller, of Stockport, placed all the cities except Wells. Congratulations Keith – a voucher for £50 is on its way to you.

There are three competitions still open. The July's Grid Circles (someone have a go!), August's Number Circles and September's Primes Count. Any more entries? Don't forget that there is a £50 voucher as a prize for the best entry. A

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New horizons

December 6-9
Wembley Conference Centre
London

A CONFERENCE SPONSORED BY ACORN
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Acorn is to hold a major four day end-user conference running alongside this year's Computer Shopper Show.

It has been designed to bring computer users bang up to date with technology and what the company's renowned research and development team has achieved of late. Attendees will also be provided with a fascinating glimpse into the future of computing.

The conference will allow end-users to –

- **See all the latest Acorn innovations being exhaustively put through their paces.**
- **Hear from the experts who developed them, all acknowledged world experts in their fields.**
- **Gain an insight into the current projects on which Acorn is working to ensure it will remain in the vanguard of technology.**

No matter where your particular interest in computing lies, the conference will provide you with a unique opportunity to learn more.

For the timetable offers something for everyone. The conference itself is divided into two distinct seminar programmes - one running on the Thursday and Friday, the other on Saturday and Sunday.

Drop into a seminar of your choice – or attend them all – and you'll be given discount vouchers redeemable against purchases out on the exhibition floor.

There you will find up to 280 stands, including the massive Acorn Village, where the company will be flanked by all its leading third party suppliers.

Here then is YOUR chance to be not only entertained and informed but also to purchase computer Christmas presents at unbeatable prices. And it's all thanks to Acorn.

But don't leave it too late. Conference tickets are limited and will be allocated on a first come, first served basis.

Ensure your seat by completing and returning your application form TODAY.

Timetable of events

THURSDAY AND

Conference registration

Complete the registration form below. Sessions are priced at £7.50 each on Thursday and Friday and £5 each on Saturday and Sunday. Or buy a "Rover ticket" and attend all sessions - £30 per ticket for Thursday or Friday - £15 per ticket for Saturday or Sunday.

Entrance to the Computer Shopper Show at the door is £5 for adults and £3.50 for under 16's, but for Acorn conference delegates only we are offering a reduced rate at £3 per adult and £2 per child. "Rover ticket" holders get in free!

Tick the boxes to indicate which sessions you will be attending:-
Please register me for the following sessions @ £7.50 each.

Thursday/Friday 6 & 7 December

- ☐ CD Rom in Education
- ☐ Schema - A spreadsheet for the family
- ☐ Image processing
- ☐ PC emulating
- ☐ Music-Midi-Mania

FRIDAY

11.00 - 11.50 am
CD ROM IN EDUCATION
Speaker - *A spokesman for Next Technology.*

VOUCHER WORTH £50 for a Next Technology CD Rom Drive

12 NOON - 12.50 pm
SCHEMA - A SPREADSHEET FOR THE FAMILY
Speaker - *David Clare.*
He has worked in the computer industry for more than nine years and is best known as the head of one of Acorn's longest standing third party software houses, Clares.

VOUCHER WORTH £30 for Schema

1.00 - 1.50 pm
IMAGE PROCESSING
Speaker - *Malcolm College.*

VOUCHER WORTH £40 for Wild Visions V9 Digitiser

2.00 - 2.50 pm
PC EMULATING AND OTHER OPERATING SYSTEMS
Speaker - *Ian Lynch.*
An expert on a variety of operating systems including IBM's PS2, MS dos, Unix and Risc OS, he is the curriculum development director for the City Technology Colleges Trust. In this role, he is responsible for supporting and developing curriculum innovation within colleges throughout the country

VOUCHER WORTH £30 for Acorn PC Emulator

3.00 - 3.50 pm
MUSIC-MIDI-MANIA
Speaker - *Mike Beecher.*
A graduate of the Royal College of Music, he is the managing director of ElectroMusic Research.

VOUCHER WORTH £30 for EMR Studio 24

4.00 - 4.50 pm
RISC TECHNOLOGY IN THE 1990's
Speaker - *Mike Muller*
A key memberof the Acorn Risc development team.

VOUCHER WORTH £25 for Programmers Ref. Manuals

5.00 - 5.50 pm
DESKTOP PUBLISHING
Speakers - *Martin Chappell and James Lynn.*
Martin Chappell is the Art Editor of Car Magazine, the largest publication of its type in the UK.
James Lynn is one of the chief designers and programmers on the Impression development team at Computer Concepts.

VOUCHER WORTH £30 for Impression 2

SATURDAY AND SUNDAY

11.00 - 11.50 am
HYPERMEDIA FOR ALL
Speaker - *David Tee.*
The author of two of the original programs on the first welcome tape for the BBC Micro, he is the man behind the Genesis project.

VOUCHER WORTH £20 for Genesis

12.00 noon - 12.50 pm
SCHEMA - A SPREADSHEET FOR THE FAMILY
(See details as for Thursday and Friday)

1.00 - 1.50 pm
PROGRAMMING MADE EASY WITH BASIC 5
(Including Dabs Compiler)
Speaker - *David Atherton.*
A co-founder of Dabs Press, he is well known as a regular contributor to leading computer titles.

VOUCHER WORTH £30 for a Dabs Press ABC Compiler

2.00 - 2.50 pm
PC EMULATING AND OTHER OPERATING SYSTEMS
(See details for Thursday and Friday)

3.00 - 3.50 pm
MUSIC-MIDI-MANIA
(See details for Thursday and Friday)

4.00 - 4.50 pm
FASTER COMPUTING - *all the expansion options for the Archimedes*
Speaker - *Alex Van Someren.*
The technical director of Aleph 1, producers of the first commercially available ARM 3 upgrade, he will demonstrate the full potential of the Archimedes and discuss future possible enhancements.

VOUCHER WORTH £50 for Arm 3 upgrade

5.00 - 5.50 pm
DESIGNING DOCUMENTS WITH THE HELP OF A COMPUTER
Speaker - *James Lynn.*
A leading light in desktop publishing technology, he is a chief designer and programmer at Computer Concepts.

VOUCHER WORTH £30 for Impression 2

Getting to the conference

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DTP Column

Ian Lynch

My comments about the LBP 4 provoked a letter from one subscriber questioning its Laserjet compatibility. I must admit that I was in error in this respect. However, the LBP4 does support printing from non-RISC-OS applications and the PC Emulator unlike the Qume engine which with LaserDirect is currently RISC-OS only. The bad news is that this relies on Canon's own driver software which is common to the bigger PC applications. Rumour has it that there is a Laserjet emulation for Canon printers somewhere. Does anyone know where? There are many cheap mail order sources of LBP 4's – just reading the likes of PCW and ringing the companies involved should provide more details.

Fonts

A letter from Steve Bonnick concerns problems with Postscript compatibility of outline fonts. Postscript is a page description language – in fact, it is the industry standard for DTP. (See DTP history below.) The good news is that fonts which have the same dimensions as Postscript equivalents will work with a Postscript printer provided the names in the Postscript file sent to the printer match those the printer expects. This may involve editing the file PSProlog in !PrinterPS driver and should be described in documentation available with the fonts. I hope to be able to provide further details of this later if it is of interest.

The Electronic Font Foundry give details of how to do this with their fonts and Beebug supply a modified Postscript driver with !Ovation for theirs. The bad news is that some fonts are new and do not have Postscript equivalents and so will never be able to print on a Postscript print device.

If you have Postscript print facilities or are thinking of sending files to a Postscript typesetter for professional finishing, you must make sure that you use Postscript compatible fonts so ask at the time of purchase. Acorn DTP uses Ventura font numbers if additional fonts are used and the DTP configuration file needs altering. I have a list of Ventura font numbers and Postscript filenames if they are of use to you. Send a SAE and I will send you a copy.

Unfortunately, you will still need to work out equivalents such as Trinity for Times Roman and Homerton for Helvetica. The equivalent of New Baskerville-Bold, for example, may not be obvious. Basically your font supplier should be able to help with these matters and it is a good reason to make sure you are a legitimate customer!

Computer Concepts News

Impression 2.0 and Impression Junior are now being shipped, and there is quite a demand so a little patience may be necessary. *(We have both Impression II and Impression Junior in stock. Ed.)* Laser Direct Hi-res needs a few software tweaks and may well be ready when you read this. *(We have them in stock now. Ed.)*

For those uncertain about which version of Impression to buy, here are the main differences. Impression Junior does not have master pages, and new pages copy the design of the previous page. There is no styles menu option but there is an 'Effects' option (this wasn't available in Impression 1) for altering fonts and point size, etc. Junior is less capable with long documents as there is no virtual text operation but this shouldn't bother most people. There is no facility for compiling indexes (or should it be indices?) and colour control is limited to RGB.

There is no dongle or protection other than the licence number. Computer Concepts will provide an upgrade to Impression 2 for the difference in cost. I would recommend those new to wordprocessing and DTP to purchase Junior and upgrade if and when the missing features become a limitation. Experienced users need to decide whether or not some or all of the features are necessary and worth the extra cost. Don't forget that there are also Ovation and Tempest though I am still unsure as to the final release date of the latter.

CC's marketing strategy is interesting. Impression Junior now competes directly with Ovation which has disc software protection and Tempest which is at the time of writing unavailable. Ironically, bearing in mind all the dongle fuss, some people will be enticed to buy Junior simply because it is not

protected and once bitten, I suppose the natural progression is to Impression 2.

By getting Impression 1 on the market first (neglecting Acorn DTP which was not really viable on a 1M machine) at a time when the majority of users had only 1M, CC were able to establish a big user base reinforced by the dongle to ensure the recouping of development costs. Now they can afford to market aggressively with an unprotected Junior when Beebug really have to protect Ovation in order to have any chance at all of recovering the development. This is rather a shame because Ovation is a quality application and if it was a programmable database it would almost certainly be the market leader. The same is probably true of Tempest.

In my humble opinion if CC were to offer Impression Junior at say £50 plus First Word Plus or Acorn DTP as trade-ins they would sew up the market because all those people buying learning curve packs could exchange their heavily discounted software for something better and a low exchange price might persuade existing users to up-grade. Alternatively, Beebug or Clares could get in first and make sure the balance was redressed. Clares are a logical choice for Acorn DTP trade-ins since Tempest is the most similar to Acorn DTP. Whatever the case, the customer benefits.

In fact, Impression Junior offers many more features than Impression 1 and, excluding those things mentioned above, has the same additional features as Impression 2. This amounts to some 80 extras which are too numerous to list, but some I have found particularly useful are as follows.

- Grouping of frames – rather like grouping objects in Draw (though Junior only allows multiple frame selection)
- Simpler but more control over the printer.
- Effects menu for local style applications
- Page rulers
- Far better ruler implementation
- Key short-cuts on menus
- Graphics can be panned and rotated with the mouse (Junior has pan only)
- Double click on graphic to produce dialogue box
- Draw files can be loaded as frame borders (not on Junior)
- Improved scrolling dialogues

If there are any Acorn DTP, Ovation or Tempest fans out there please write and give me your views. I would particularly welcome comment from people who have used more than one of the DTP's, to see if there is a consensus about which is best, or perhaps which is best at particular types of task.

DTP – History

Last month we got as far as establishing page printers as a milestone in the development of DTP. In fact, it was a Canon engine in a Hewlett-Packard printer which established the laser printer as we now know it. ('Engine' is the term used for the printer mechanism which uses a laser beam and the fact that light affects the conductive properties of a charged drum to produce an image. The toner – which is a mixture of carbon powder and glue – sticks to electrostatically charged areas and heat is used to melt the glue and stick the carbon powder to the paper. The process is called Xerography and is also the basis of photocopying – but I digress!)

Unfortunately, at this time, memory was very expensive (by to-day's standards) and it takes about 1M to store a 300 dpi image of an A4 sheet, but the price was falling to below £1000 per Mbyte and page printing offered better quality, greater speed and more versatility than dot matrix, daisy wheel and ink jet printers.

At about this time Apple produced a computer with a graphical interface (the Macintosh) and Adobe unleashed Postscript. The thing about Postscript was that it used outline definitions of the characters to produce the bitmaps, (the thousands of dots which make up the characters) calculating the patterns of dots in real time. So instead of having multi-megabytes of bit maps for all the character sets and all the point sizes, a simple mathematical formula could generate the required pattern at the time of printing. What is more, Adobe used very high quality character definitions which meant that they could produce extremely high quality output, at least as good as by conventional printing.

At 300 dpi, some compromises were inevitable so a technique called hinting was used in order to improve the appearance of characters at low resolution. Postscript page printers are basically dedicated computers

with software (Postscript Page Description Language) to produce an image from information sent by the computer to which they are attached. Since Adobe get hefty royalties on every printer with their software and font definitions, and the printers need at least 1M of memory, they are notoriously expensive when compared to Laserjet or Laser Direct. Postscript printers do produce text pages very quickly and in high quality. However, graphics are slow, probably because it was not really envisaged that 300 dpi would give sufficient graphics quality to worry too much about this. Postscript is an established standard which Adobe have done their best to monopolise but there are signs that this is near an end. Professional typesetters with much higher resolution than page printers and with the benefit of colour use Postscript files to produce many of the magazines you see at the newsagents.

The Mac, the pageprinter and Postscript arrived at just the right time for Apple and it was this that ensured the continuing dominance of the Mac in the publishing industry. Of course there are still improvements to be made. Macs and PC's still use bit mapped fonts for their screen displays and so none of their DTP software is truly WYSIWYG. The way that Postscript printers handle fonts and require memory is very inefficient in comparison with what is possible. Next month I will explain why the Archimedes system represents the next logical step. A

Careware Nº 8

Edward Hollox

I have had a look at Careware Disc Nº 8 and decided that the best way to convey what it offers is to describe each of the applications separately.

!Painter

This is a good 256-colour art package which I think is as good as or even better than !Arctist+. On loading, you are presented with a black screen with a white cross in the centre. Pressing <menu> on the mouse displays a 3D-effect menu with icons representing all the usual art-package features such as ellipses, parallelograms and copy/move. These features, when selected, are well implemented and the use of them is very intuitive. Pressing <menu> during these operations reveals a Pro-Artisan style palette and pressing <adjust> on the palette returns you to the main menu.

Good documentation is included and compacted screens can be loaded or saved to save disc space. A compressed example is supplied.

Although it has nowhere near the features of Pro-Artisan or Atelier, or not even as many as !Arctist+, those which it does have are easy to use. This program would be ideal for children who are confused by the plethora of options in more expensive packages or for any Archimedes owner who wants an art package but has not much money to spare.

!Spellword

This is a primary wordprocessor designed for children of 5+, and it is in a 40-column mode, so the text is large and easy to read. The top half of the screen is devoted to a dictionary in which any word can be selected by using the mouse – clicking it places that word on the lower half of the screen. The dictionary is of medium size, but contains most of the words needed at that age. Of course, you can type normally using the keyboard. The deleting functions operate as a PC – backspace deletes the letter before the cursor, Delete erases the letter at the cursor. This is more logical, if you think about it.

This is a simple program with good documentation (very important!) and in my view seems good for primary children but a teacher's professional opinion of this program is no doubt better.

!Life

This a multi-tasking version of that ubiquitous program about cells. This is a simple implementation of it, and has a small window with large cells, neither of which are resizable. Better non-multitasking ones are available elsewhere.

Demons

A program which again simulates cells arising from chaos into an orderly pattern. For more detailed information see Micro User March 1990.

FastGrow
A faster version of Mike Cook's Diffusion Limited Agragation. Those knowledgeable about fractals will know what that means – I don't! The program produces a pretty pattern which resembles lightning or a fern. I preferred it in the original MODE 13 since you could see the resemblances to nature better, instead of MODE 24 in this program.

!BallGame
This is breakout with a difference – the game area is on the icon bar! An icon appears on the left side of the icon bar with a bat on one side – controlled by the mouse, and some bricks on the other side of the icon. The score is in white in the middle of the playing area and you have only one life. Unfortunately you cannot pause it and do something else, so you quickly get bored with it.

!Patience
This program contains two forms of patience each fully explained in the program. The graphics are adequate but a nice touch is that parts of Handel's Messiah play in the background. The volume can be altered or the music can be turned off completely. The game is fully mouse controlled and is ideal for a few minutes relaxation.

Leapfrog games
These are four programs which play peggity on different shaped boards, which are drawn very well, with either two or three players. The computer can take place of any of these players so that you can play the computer. You move by dragging your pieces by mouse over others to another square. If you jump over another player's piece that disappears. You win when you have cleared all your opponent's pieces.

It took some time to work this out as there is no documentation. Despite how obvious a game or utility may seem to you, to another it may be a puzzle so always include some documentation.

Music for Maestro
Another selection from Tom Measures which comprise of 7 classical pieces and 7 modern pieces.

!Autoform
An automatic disc formatter.

!1stFile
A useful utility for converting to and from First Word Plus formats. (View, Wordwise Plus and plain text.)

!DiscLabel
An ingenious multi-tasking utility which prints customised disc labels. You can type directly into a window containing a picture of a disc or drag files to the window which are then included on the label. When finished, you can print it out using a variety of options. Fully WYSIWYG.

!LineEdit
This utility allows you to edit command line instructions using the cursor keys.

!NewBar
This interesting utility at first installs itself on the icon bar. On clicking it you are warned that continuing will lose data in the desktop. If you continue, the screen is redrawn with the icon bar now a window which you can move and resize and which behaves like any other window except that you cannot close it. Why anyone would want a movable icon bar puzzles me!

!NewCodes
This converts the old 01 code London numbers into either 071 or 081 and is fully multi-tasking.

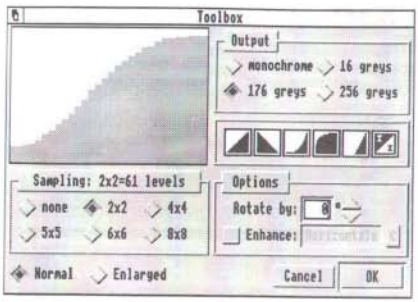
!RMAman
This is a very good multi-tasking utility by Keith Sloan and allows you to see what consumes the memory in the RMA area. On clicking the icon on the icon bar, a small window appears which shows the memory consumption of Application Sprites, ROM workspace, RMA modules and shows the memory free. Clicking the Sprites bar in the window displays a larger window with all the application sprites the computer has read that session. You can select various sprites and order the computer to forget them, thus saving memory. Similarly, you can examine which modules take up the most room in the other two bars. This is a useful utility, especially when you want to free every bit of spare memory in the RMA.

Overall this Careware disc represents good value for money and remember that every penny of the profit goes to charity. A

SCAN LIGHT Plus

The latest generation Scan-Light Plus software provides a new easy to use and very powerful interface to the range of Scan-Light scanners and represents the most advanced software available for monochrome scanners on the Archimedes.

The main features of Scan-Light Plus centre around the scan toolbox. This controls the altered image view and allows the original scaled image to be sampled or anti-aliased in numerous different ways. This feature allows monochrome dithered scans to be turned into full grey-level sprites, ideal for incorporation into DTP or other programs. For example 4 by 4 sampling provides 16 grey-level images, while 8 by 8 sampling will turn an image into a 64 grey-level. The grey-map allows precise and accurate control over these grey-levels. The grey-map cannot only lighten or darken the image but also invert it or, more usefully, compensate for any non-linearities in the original picture or the printer. The grey map provides direct control over the gamma correction curve. The toolbox also controls the number of greys in the output file - it's even possible to typeset images with 176 grey-levels suitable for photographic quality results.



Scan-Light toolbox.

Features Include:

- Totally RISC OS compatible supporting in-memory transfer.
- Preview during scan to indicate progress.
- Two views of scanned image, original and altered.
- 61 grey-level screen display.
- Horizontal and vertical image flip.
- Prints either original or altered image, any scale, upright or sideways.
- Region select and crop to any rectangular portion of image.
- Original or altered image may be scaled by any amount.
- Original or altered sprite save.
- Sprite load facilities.
- A variety of altered image options;

- 6 sampling options from 1 by 1 to 8 by 8 sampling.

- Full control over brightness and contrast.

- Full grey-map control.

- Non-distorting image rotation in steps of one degree.

- Image rotation 500 times faster than !Paint.

- Additional image enhancement options such as edge detection.

All existing Scan-Light owners can obtain free upgrades of software.

Details subject to change without notice.

Scan-Light Junior A3000	£189.00 + VAT
Scan-light Junior	£189.00 + VAT
Scan-Light II A4	£399.00 + VAT
(Optional sheet feeder for A4 scanner)	£100.00 + VAT

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>
> "Genesis is an impressive product that is certainly here to stay." *Geoff Brown - Micro User May 1990*

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Language Column

David Wild

The October issue of Byte has a number of articles about Object Oriented programming and similar articles have been appearing in several magazines recently. (The word paradigm must have been added to a lot of word processor dictionaries recently!) While there is no Object Oriented language available for the Archimedes, when you read the articles you realise that many of the benefits are already available to us.

Both 'C' and ISO-Pascal provide the "information hiding" properties in the form of separately compiled modules which can be imported into programs as necessary. Although the "inheritance" of properties cannot be available, we are over half way to what is needed.

One of the other changes which is being discussed is the idea that the Object Oriented programmer doesn't normally write a program from scratch but looks at what he has already got to see what can be adapted to meet the new requirements. I feel that the WIMP method is already pushing Archimedes programmers in this direction as much of the program basics don't change for different applications. A vast number of mathematical graphics programs, for instance, can be generated by altering the procedure "redraw" and this can be extended to many other applications.

It occurs to me that, now that we have multi-tasking available to us, we need fewer massive programs and can do much of our work with a number of small programs which can send and receive messages among themselves. More work needs doing on this but I think that it could well be the way forward and should lead to a reduction in the difficulty of producing systems.

ISO-Pascal Extensions

A year or two ago, I first talked about the Graphics Extensions package from Smith & Wiggins as a useful part of a Pascal programmers' toolkit. Recently, I have received release 2 of this package and feel that it is worth mentioning again.

The package comes in the form of ten compiled Pascal modules with associated 'include' files for importing the various routines into your program.

The first two modules, 'General' and 'Graphics' really add to Pascal the routines which are in BASIC as a matter of course. Things such as 'VDU', 'Draw' and 'Circle' may not seem very exciting but having them available makes programming life very much easier.

Another module 'Strings' cannot, for reasons connected with the way Pascal works, mirror the BASIC statements exactly, but it does ensure that you can do with Pascal strings anything that you can do with astring$. There is a limitation on this module in that it deals with strings of a fixed length of 80 characters. Most of the time this is no problem but, when it is, any good Pascal textbook will show you how to write your own procedure to cover the problem.

A module called 'Spextend' provides a whole set of routines for dealing with sprites, and another called 'Fonts' does the obvious things in that direction.

There is another module called 'Screenio' which provides facilities for input and output of variables at various places on the screen but this is really being overtaken by developments in WIMP programming.

The most important module of all is the 'Wimp' module which provides all the functions and procedures necessary to write multi-tasking programs using the Window and Task managers. A sample program is provided and this has the advantage that it actually does something which can be detected outside the program – and could be adapted, fairly easily, to do useful work.

However, I do feel that as with the Cambridge Pascal sample program, this section is grossly underdocumented. It was very difficult, at first, to see what was going on but I found that the best way was to work through the Risc User introduction to the Wimp, translating their methods to the procedures provided. By doing this, I managed to produce a program with windows and working menus, and now feel that I have a much better understanding of what is going on.

There are two further modules concerned with graphics work, 'Glib' and 'Transform'. The first of these allows you to work with the co-ordinates of the

original system and the second does the transformation to screen co-ordinates automatically. I have found these modules very useful for some work I have been doing with Chaos theory.

The set of modules is completed with 'Hourglass' – again something which is not very exciting but having it available makes life a lot easier.

There are sample programs to illustrate all the modules, and a sample data file for the WIMP program. It would have been better if at least one of the graphics examples had used the WIMP module but, once you have begun to understand the way it works it should not be too difficult to adapt at least one of them.

Even with the criticisms I have made of the documentation this is a very useful package, and one which will soon save the £30 that is charged. Some of the material really ought to have been in ISO-Pascal as supplied but, as it isn't, any serious Pascal programmer ought to have this disk. A

Small Ad's

• **512k RAM** upgrade for a A305 (due to Willi Langhan's DIY upgrade). £60 or swap for a MEMC 1a. Contact Mr M Ball on 0258–452581 ext 2209 during work hours.

• **A3000 base + P.R.M.,** £200+ software. Worth £900, will take £600. Phone A Spencer, 0272–844388 evenings/weekends.

• **A310 + RISC-OS**, IFEL 4 slot backplane and PC Emulator £490. Telephone Colin on 081–227 9306 4 pm to 8 pm.

• **ABC-2 BASIC** compiler £50. Phone Geoff on 0925–811420.

• **ArcTrivia** (with reg card) £14. Phone Rob Browning 0242–231540.

• **Armadillo mono sound sampler** + software £95. Stuart Halliday 0506–411162 after 6 p.m.

• **Armadillo Sound Sampler**, 8 bit stereo, with midi control, manual & software, £145. Phone 081–655–0399 evenings.

• **Complete set** of volumes 1 to 3 of Risc User £20 ono. Telephone Stuart Bell on 0273–304825.

• **Computer Concepts ROM podule** with battery back up and 32K RAM chip, also with RISC-OS disc, £40. Contact Des Woon on 0225–880257.

• **Dabs Instigator**, boxed as new £15. Telephone Alan Mothersole on 0334–55772.

• **First Word Plus** £45, Knowledge Organiser £25, Minerva's Atelier £35, Genesis £40 and FontFX £5. Telephone Mr H Smith on 0536–724981.

• **Interdictor V1.02** plus Voltmace joystick £30 (including £5 to Archive charity pot). Peter on 0572–812915.

• **Interdictor** £10, mint condition. Eddie Lord, 9 Blackheath, Pound Hill, Crawley, W Sussex RH10 3UF.

• **Interdictor** £7, Jigsaw £15, Zarch £3, Quazer £5, Arcendium £5, E Type £7, StarTrader £3, WordUpWordDown £3, Terramex £7, Hoverbod £5, Thundermonk £7, Apocalypse £12, RISC-OS Companion £7, Holed Out £7, Clares Demo discs 50p each. Alan on 0233–629868 (evenings).

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• **Oak A3000 SCSI podule** £150, barely used. Glenn 0932–567614 evenings.

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• **Soundsynth** £25, Render Bender £40, Arthur PRM's £17, Terramex £10, WordUpWordDown £10, Nevryon £13, Hostages £13, 8 Risc User Discs (vol 1.5 to 2.3) £16. Contact Jeremy Mears on 0242–521050.

• **Z88 + mains adaptor**, battery charger, 2 sets of batteries, 128k RAM pack, soft pouch and Z88-Arch link software + lead. Cost £350, sell for £250. Contact Mark Bright on 0384–455066 after 6 pm.

• **Charity Sale**

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- **IFEL 4-slot backplane** £35 A

Hardware Column

Brian Cowan

Of all the questions which people ask me about the Archimedes computers, the most frequent relates to the relative merits of the ARM3 and the floating point coprocessor podule. I have written about this in the Hardware Column on various occasions, giving my opinions based partly on my own tests and partly on published results.

I wrote a review of Aleph One's ARM3 upgrade, based on a one day visit to the Atomwide headquarters where I carefully ran through a series of speed tests. Readers will recall that I was impressed with the product but, unfortunately, speed comparisons with the FPU were not available.

I have finally managed to purchase my own ARM3 and so I have been able to test it out with a much wider range of applications. At the same time, I was also able to borrow an Acorn FPU and so it was possible to run an extensive series of comparisons. Here are the results of the tests I tried. (All times in seconds)

BASIC programs

	ARM3	ARM2	Ratio
Ackerman	0.84	3.18	3.79
FFT	0.98	2.84	2.90
Savage	0.80	2.31	2.89

This table shows the speed improvements obtained with an ARM3 when running interpreted BASIC V. Ackerman is an highly recursive integer program. You would get no speed increase here using an FPU. Savage is the other extreme, being almost entirely floating point. However neither of these tests is really typical of a realistic program. Therefore I include timings for a fast Fourier transform (FFT) which is the sort of real program that I would be running. We see that the ARM3 gives about a three times speed improvement.

Compiled BASIC

	FPE	FPU	ARM3	ARM3/FPU
	–ARM2–			ratio
Ackerman	0.14	0.14	0.07	0.50
FFT	3.21	0.41	1.14	2.78
Savage	7.34	1.42	2.42	1.70

Next, we consider some tests on the same three programs when they have been compiled. I compiled them with Silicon Vision's RiscBASIC. Since the compiled code makes use of the floating point emulator/coprocessor, we can now make some comparisons between the ARM3 and the FPU.

As expected, the FPU does not speed up Ackerman since it is an integer only calculation. However, Savage is speeded up some five times while the FFT runs almost eight times faster. When looking at the advantage of the ARM3, we see that Ackerman runs twice as fast while Savage is three times faster. The realistic FFT runs about 2.8 times faster. Except for the integer Ackerman calculation, the FPU gives the greater speed increase, being about three times faster for the FFT.

Compiled Fortran

	FPE	FPU	ARM3	FPE /ARM3	ARM3 /FPU
Savage	7.29	1.46	2.52	2.89	1.73
Triglog	3.12	0.43	0.93	3.35	2.16
FFT	2.07	0.31	0.63	3.29	2.03
Lattice Sum	965.9	210.7	355.3	2.72	1.69

Not everyone uses BASIC. Serious number crunchers are likely to be programming in Fortran. To make some fair comparisons, I transcribed Savage and FFT into Fortran. Also, I ran the Triglog benchmark as well as a program called Lattice Sum. The latter is a long program which does many floating point operations and it happens to be the problem I am working on at the moment. Looking at the FPU results first we see that, once again, Savage is speeded up about five times, while FFT runs about 6.7

times faster. My lattice sum is about 4.6 times as fast.

ARM3 speed increases are again about three times for Savage and FFT. The general conclusion is that the FPU is about twice as fast as the ARM3, although the advantage decreases for larger programs.

Interpreted BASIC versus compiled Fortran

	BASIC	Fortran+FPE	Ratio
Savage (ARM2)	2.31	7.29	3.16
Savage (ARM3)	0.80	2.52	3.15
Triglog (ARM2)	0.74	3.12	4.22
Triglog (ARM3)	0.19	0.93	4.89
FFT (ARM2)	2.84	2.07	0.73
FFT (ARM3)	0.98	0.63	0.64

It is accepted that BASIC V is the best, most efficient version of interpreted BASIC ever produced, so I was interested to compare the speed of some BASIC programs with the equivalent in compiled Fortran. Savage, Triglog and FFT were run in BASIC and Fortran. The ratios are similar for both ARM2 and ARM3. We see that Savage and Triglog are actually faster in BASIC! However FFT runs faster in Fortran and there would be a further speed up to be had using a FPU.

Conclusions

I am sure there are many more conclusions which may be drawn from the above timings. However, for the ARM3/FPU question, we can summarise as follows:

For floating point intensive programs, very approximately, ARM3 gives about a four times increase while the FPU gives about eight times. This applies to both Fortran and BASIC programs.

In deciding which upgrade is for you, you should bear in mind that the ARM3 also speeds up all non-floating point operations, as well as the interpreted BASIC. Also, Acorn are working on their own custom FPU which should be some ten times faster than the existing FPU. This means that the existing FPU is all but obsolete, but on the other hand its price should drop and you might even be able to pick up a second hand one quite cheaply. A

Ace Computing

RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It works like a 3D version of Draw, and now forms the centrepiece for a number of related products allowing the creation of complex animation sequences with the minimum of effort.

Mogul makes full use of **Euclid**'s unique hierarchical data structure to generate films of 3D objects with articulated motion and simultaneous camera motion.

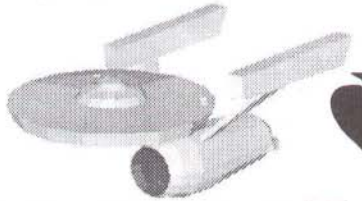
Tween produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

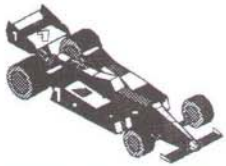
Splice allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Support is provided for import and export of Sprites and Drawfiles. Films can be played by the **Projector** which comes free with **Euclid, Mogul, Splice and Tween**. Films and Euclid files can be used with Genesis.

Such is the enthusiasm for **Euclid** there is now a user group called **Elements** which provides a quarterly disk containing hints, tips, animations and user pictures like the ones in this advertisement.

Euclid £70 **Mogul** £20 **Splice** £30
Tween £30 **ArcLight** £50
Ace Computing, 27 Victoria Road,
Cambridge, CB4 3BW.
Tel: (0223) 322559
All prices include VAT and P&P.





Ace Computing

PipeLine

Gerald Fitton

Firstly let me thank all of you who have written to PipeLine with your comments and opinions. I know many of the letters (particularly those which are of the 'keep up the good work' variety) don't need a reply but I'd like to thank you all the same. My particular thanks to those who have bought the quarterly PipeLine discs and have then written to me saying how much you like them. The October 1990 issue came out on time (1/10/90) and the next issue will be sent out during the first week of January 1991. The annual subscription is £18.00 for the four discs July 1990 to April 1991 inclusive (or an extra £8.00 if you've already bought the first two at £5.00 each).

Sorting ranges

Under this heading last month, I explained how to enter a 2 by 2 table of numbers in the block B2C3, take the average down the columns (averages in B5 and C5) and find the sum along the rows (sums in E2 and E3). I left you with the problem of what to enter in the cell E5 and said I'd give you my answer this month. Of course you could use either the average of the E column or the sum of the 5 row. Both should be the same. My solution was to print "True" if they're the same and "False" if not by using the formula: if(sum(A5D5)=avg(E1E4) "True", "False"). The idea is that, if I have mistyped a formulae, or somehow or other replicated it incorrectly, or allowed it to become corrupted, then I will get a "False" printed, warning me that I've made a mistake. Note that I have included the blank rows (1 and 4) and blank columns (A and D) in the sum and averages so that, as I showed last month, I can sort the rows without corrupting the sum() and avg() formulae.

I have some oldish spreadsheets that I think are of the PipeDream 2 vintage where I have used this technique. I loaded them into my latest version of PipeDream 3 and (in a few cases) got "False" where I had "True" before! Now, you will tell me if I'm wrong but, I think that at some stage PipeDream was upgraded to calculate with increased accuracy (i.e. more significant figures) and maybe rounding is done differently but, in a few cases, I've had to use an approximately equal function such as if(abs(sum (A5D5) – avg(E1E4)) > 0.00000000001 * sum (A5D5), "True", "False") instead of the exactly equals formula above which (I think) compares values to about 17 or 18 significant figures!

A relational database

The first part of the series on this subject by Stephen Gaynor on the October quarterly PipeLine disc has been well received. In fact, the only complaint I'm getting is that people say they "can't wait" for the next issue. Sorry! The next part of the article won't be out until January. If it's any consolation to you, I'm having to wait for it too!

Lookup a date

Des Fry posed this problem (of vlookup with a date) and its solution last month. The latest version of PipeDream does look up the nearest earlier date in exactly the way Des wants. The functions vlookup and hlookup must be sorted in ascending order of the key field. If you haven't got a sorted list then you have to use lookup which works only with an exact match.

Customised functions

Last month, I said I would explain how to use a dedicated dependent document to process data and then return the processed data to the original (or a new) sheet. The intermediate document is rather like a PROCedure or FN in BASIC; you can use it with any set of data. Implementing this philosophy more generally could lead us to the creation of a library of 'Dependent Documents' able to process data in a variety of ways. For my example, I am going to transpose a matrix. I'm sure you can think of other processes which you can apply to a set of data such as finding the inverse of a matrix (solving simultaneous equations), finding the Eigen values and Eigen functions of the matrix (if you're into those things) or (less numerately) generating labels from a database of names and addresses.

Have a look at figure 1 overleaf. This contains a screendump of two spreadsheets, [Sheet1] and [Sheet3]. [Sheet2] is the (hidden) intermediate spreadsheet and is shown in figure 2. For those of

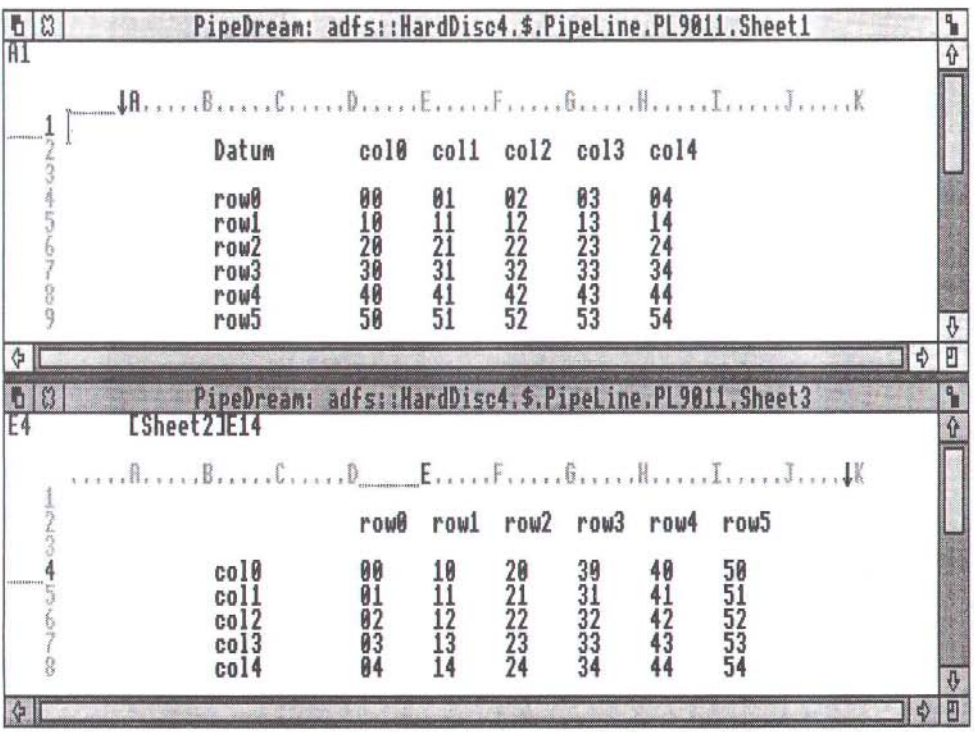
you who are wondering whether to look up 'Transpose' in a dictionary or not, [Sheet3] is the transpose of [Sheet1]. The data in the rows of [Sheet1] have been 'transposed' to become the columns of [Sheet3] and the columns of [Sheet1] have become the rows of [Sheet3]. In this example [Sheet2] transposes the data matrix of [Sheet1] but we could make [Sheet2] do many other things with the data matrix.

If you have the three sheets on disc then double click on [Sheet3] and all three sheets will be loaded. If you change the value of any of the slots of [Sheet1], then the corresponding value displayed in [Sheet3] will change too. For example, if you change the value in [Sheet1]E8 from 40 to Fred then [Sheet3]I4 will also change from 40 to Fred. If you mark the block [Sheet1]C4I9 and Sort in descending order so that the order of the rows in [Sheet1] is reversed, then the order of the columns in [Sheet3] will also reverse. This is the way a 'Transposed Matrix' is supposed to work. Even more interesting, if you add (or delete) rows or columns in [Sheet1] outside the matrix this has no effect on [Sheet3]. Adding (or deleting) rows or columns in [Sheet3] outside the matrix does not affect the accuracy of the transpose operation either.

If you haven't got the disc files and you want to work through this example then here's what you do. First create three blank sheets called [Sheet1], [Sheet2] and [Sheet3]. I have added about five extra columns and then set the widths of all columns to 8 using <Ctrl>+W with the range A to K. Enter the data as shown in figure 1 into [Sheet1]. Now open [Sheet2] and, in cell [Sheet2]C2, press F2 to get Edit expression and type in [Sheet1]C2 followed by <Return>. Mark the block [Sheet2]C2I9 and replicate the formula in C2 through the block with <Ctrl>+BRR followed by <Ctrl>+BRD. Have a look in a few other cells and you will see that replication has changed the formula so that every cell in [Sheet2] refers to its counterpart in [Sheet1]. For example, cell [Sheet2]H8 contains [Sheet1]H8.

The index(col,row) function

Last month, I said I would explain how to use the

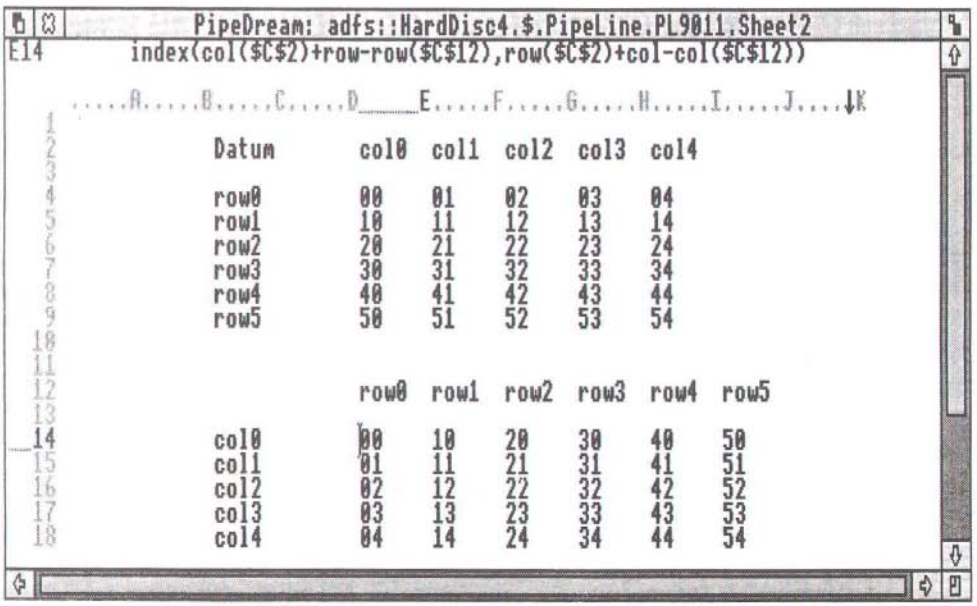


index(col,row) function to transpose a matrix. Here's where I get my chance. Look at the formula shown in figure 2 for cell [Sheet2]E14. This (identical) formula is in every cell in the block E14J18 as well as every cell in the row E12J12 and the column C14C18. You need type the formula once only (say in E14) and then use the replication commands. Because the cells C2 and C12 are typed in as C2 and C12, when the formula in cell E14 is replicated, the cell references do not change. This is the effect of using the $ to fix the cell references during replication. You will see the effect of the [Sheet2]E14 formula is that the matrix with its top left corner at C2 is copied into a block of cells with its top left corner at C12 but the formula has changed rows into columns and columns into rows. The matrix has been 'transposed'.

The formula includes the two datum cells, C2 and C12, which are located at the top left corner of the original and transposed matrices respectively. If you now insert a row between the matrices or above the original one (block C2I9) or use <Ctrl>+BM to Block Move one (or both) of the matrices to anywhere else in [Sheet2], you will find that the formula alters in every cell of the transposed matrix to reflect the new position of the two datum cells. Block Move updates cell references. The formula may look complicated but it can be broken down in stages which make it more understandable. Consider the formula in E14. The part of the formula row–row(C12) is the number of rows that E14 is below C12 (i.e. 14 – 12 = 2). This number is added to col(C2) to give the number of columns to the right of C2 (two columns to the right of C2 i.e. column E) where you have to get the value to put into E14. The same sort of formula for the row targets cell E4 (two rows below C2) as the cell to copy into E14.

Returning the answer

The sheet [Sheet3] picks up its values from the transposed matrix of [Sheet2]. As an example, cell [Sheet3]E4 contains the expression [Sheet2]E14 as shown in figure 1. This formula is replicated across



the whole sheet from E4 to J8 as well as along the row E2J2 and down the column C4C8. Of course the copy of the transposed matrix shown in [Sheet3] could have been returned to a space in [Sheet1]. Once you have all three sheets, you can add or delete rows (outside the matrices) or move the matrices about to your heart's content. The formulae in all cells will be updated so that the transpose is correctly produced by the combination of the three sheets.

What next?

At the risk of boring you, but with the intention of making sure you see the potential of this method, let me repeat that if, instead of just transposing the matrix of block [Sheet2]C2I9, you carried out some other (more complex) matrix operation writing the result into the block [Sheet2]C12J18, then [Sheet3] would contain not the transpose but the result of the more complex matrix operation. You could give [Sheet2] the more meaningful name 'Transpose' to indicate what it does.

You could add or multiply pairs of matrices returning the result to [Sheet3]. Those of you into these matrix things will know the usefulness of multiplying a matrix by its transpose and returning the answer. With square matrices you can make [Sheet2] find the inverse matrix. The operation of inverting a matrix is a general method of solving multivariate simultaneous equations. As I said earlier, you could find the Eigen values and Eigen vectors in [Sheet2] returning the result to [Sheet3]. Wouldn't it be nice (anyway, it would for some of us) to have a library of [Sheet2] procedures for a whole range of mathematical operations? Indeed, not only mathematical operations on matrices but many database operations lend themselves to this method of using a hidden intermediate sheet. Well, if you come up with any good ones I'll publish them and, using the method I've described, I'm sure you will be able to use an expert's expertise to improve a solution to your own database or matrix problem.

Disc copies of PipeLine files

Disc copies of all the files mentioned in this article (except Stephen Gaynor's relational database article) are available from Norwich Computer Services by buying their monthly disc (£3.00).

Contributions

Once again, thanks for all your contributions and for supporting the quarterly PipeLine Discs. I'd like you to keep up the good work too – I enjoy reading your letters. A

Matters Arising

• **Datastore's !FontFX** – Since my review of !FontFX in the Archive 3.9 p37, !FontFX has been improved even more (I am now using version 4.06). These points should be read in conjunction with the previous review; a large number of slight deficiencies have been corrected and the appearance of the control window has been improved and better arranged.

When you choose to create a drawfile, a preview window is opened showing what the output will look like. The position of the wall or floor shadows can be selected (NE, NW, SE, SW) and a new rotate option has been included. The characters can have their sizes adjusted in the X or Y directions and the program can cope with any number of any type of outline font and now works without needing to access the standard Acorn outline fonts.

These improvements have enhanced this already excellent utility even more. For only £10, you are crazy if you use DTP and do not have it. Many of the effects can be obtained using 4mation's Poster package but for ease of use and price, !FontFX is unbeatable.

Existing owners of !FontFX can obtain a free upgrade by returning their original disc to the Data Store including return postage and an address label. Simon Burrows

• **Greek (3) cont'd** – In my letter in Archive 3.12, about solving the problem of the slowness of the Computer Concepts Greek3 font, I gave the details of changing the internal name of the font from Greek to Greek3, in order to make it match the external name, thus retaining compatibility with existing files. Unfortunately, CC have thrown a spanner in the works by starting to supply Impression (v1.07 at the last count), with the font simply renamed Greek. This means that unless you are prepared to do some

editing, you really need both Greek and Greek3 fonts available under the font manager for file compatibility with other users, which takes up valuable disc space and font cache RAM.

Getting around this problem doesn't cause serious problems with existing Impression documents; all you have to do is make sure that both Greek and Greek3 fonts are available under the font manager and then edit the appropriate style from Greek3 to Greek. Finally, you can delete the !Fonts.Greek3 directory to save disc space, etc.

Life is not so easy with !Draw files, however. Theoretically, I believe that you could edit the information at the beginning of the file from Greek3 to Greek using !Edit but it isn't as simple as just deleting the "3". I don't know enough about the !Draw file format to do this reliably, so I have had to delete any Greek3 characters from my existing !Draw files and replace them with Greek ones.

Thanks for nothing, Computer Concepts! I'll consider forgiving you when my upgrade to Impression II arrives. Richard Sterry, Wakefield

• **Public Key Cryptography** – A number of people have responded to the announcement in last month's Archive (page 51) about "The Public Key" magazine. The first number of the new magazine should be distributed during November but please be patient as this is a hobby interest on the part of the editors. George Foot.

• **Teletext adaptor** – Ground Control would like us to pass on the following information to users of their teletext adaptors. They have discovered that you can get data corruption as a result of using a switcher box connected to the computer by round cable as opposed to flat or ribbon cable. Changing to the latter type of cable seems to cure the problem.

• **Video Electronics** – Sadly, Video Electronics Ltd, makers of the Arvis video system have fallen victim to the problems caused by the current financial climate and have ceased trading. If you have any enquiries about Arvis or related matters, contact Alan Baldwin at 8 Old Hall Mill Lane, Atherton, Manchester M29 0RW, phone 0942–674366. He is currently working on a RISC-OS version of Oscar. A

Geoscan – A Geographical Database

Ian O'Hara

Geoscan is a geographical database containing various statistics on 100 different countries. The emphasis on the statistics is the developmental status of the country. The program comes on an unprotected disc together with another program called printout and is accompanied by a 33 page manual. Thecoauthors are a Deputy Headmaster and a Head of Geography from a school in Limassol, Cyprus.

Double clicking on the Geoscan icon loads the program. It is not a true RISC-OS application in that it does not sit on the icon bar or run in a window. Instead, it takes over the whole computer. How much of a drawback this is depends on one's views on non-standard applications. Personally, I feel in the classroom situation there is an advantage to having a program which takes over the whole computer. It restricts pupils' efforts to reconfigure the machine. The down side is that it means data cannot easily be exported to other applications.

As the program loads it creates a ram disc into which it loads data for quick access later on. During this process it actually requires a disc called Geoscan in drive 0. This has caused problems in trying to run the program from hard disc and presumably from a network. The only way I could overcome the problem was to hack the program files as there is no install utility on the version I have. I understand from the author that the next batch to arrive in the UK will have a hard disc option.

Once running, the program provides the user with three possible options besides quitting. These are :-

• Profile

• Factfile

• Survey

The first two options are very similar. Factfile presents some of the screens produced by profile as a carousel. I found profile a more satisfying way to access the information.

Profile provides a wealth of statistics on individual countries. When this option is chosen, the user is asked to choose the country. This is done via a two-

tier menu system. First a continent is chosen and then the country within the continent. Having chosen a country, a further menu gives one a choice of what statistics one wishes to examine. The ten screens available include trade, industry, health, education, population and climate. The statistics they contain are reasonably comprehensive. As well as the raw statistics, the program gives the option of providing the countries world ranking in that field. This is very useful given the developmental theme running through the package.

All the options are chosen by clicking on very colourful icons on well laid out, attractive screens. This makes the program very easy to follow and use.

The survey option moves away from individual countries and looks at individual statistics across countries and regions. There are three options in this section. The first averages each statistic for a region and presents the results on a map of the world. So one could see how the birth rate compared between Europe and Africa for instance. The second option gives the top and bottom fifteen ranked countries for any one statistic. Again, the results are shown on a map. The last option lets one examine the correlation between different statistics. One chooses one statistic for the x-axis (e.g. GNP) and another for the y-axis (e.g. birth rate). The program then plots the results for each country on a scatter diagram and then draws a regression line through the points. I found this part of the package very interesting.

Hard copy

Printout allows one to get hard copy of much of the data available in Geoscan. Individual country profile can be printed and the ranking of countries for various statistics. For example, the UK has the 59th largest land mass of those countries listed.

The documentation consists of a short description of the package and a number of photocopyable worksheets. Whilst not strictly a guide to using the package, the worksheets do provide encouragement to staff who may be unsure as to how to introduce I.T. into the classroom. They are a very useful aid to using the package and provide an excellent basis for discussion.

Throughout, the package is very easy to use. I easily found my way through the program without even opening the manual. Since the start of this term, the Humanities department have been using the package with various classes. The pupils involved have ranged considerably in ability. All have enjoyed using the program. The way the information is presented on the screen is very stimulating and draws one to explore the database further. It is refreshing to have good quality software coming from someone close to the chalk face.

I was very disappointed in one respect and that was about the absence of various countries, most notably the communist countries. I first started looking at the package at the start of August and was immediately interested in looking at Iraq. Neither that nor Iran were included, nor was Eastern Europe. I tackled the author on this point and was given the answer that statistics from these countries were unavailable, unreliable or in the case of GDP/GNP was calculated on a different basis from the rest of the world. He hoped that the changes in Eastern Europe would lead to them being included. I still think that the missing countries should have been included and a note placed in the manual that the statistics might be unreliable. The first impression I gained from the absence of certain countries was that the program was politically motivated. My mind has been put at rest on this point but I do think that clarification on this point is needed in the documentation.

The program is available from Passkey Marketing, PO Box 649, Shenley Lodge, Milton Keynes MK5 7AX. The price of a single copy of the program is £45 (or £38 through Archive). Larger orders will attract a discount of 25%. Site licences are also available at a cost of £100 plus £3 per copy. At present, there is no network version of Geoscan. As the author points out, Econet is so slow with Archimedes that the machines would probably time out before the program could load. He will be looking into this as a possible upgrade. Updates are available every so often so the data will remain reasonably current.

I would certainly recommend any Geography teachers reading this, who uses the Archimedes to buy a copy. It is a well thought out and easy to use package. A

Accounting from Apricote Studios

Andrew Cowling

Apricote Studios have produced a personal accounting package aimed at individuals who want (need) to manage their personal finances. Another two packages are also available though these are more suitable for larger businesses as they incorporate sales and purchase ledgers, invoice production and VAT reporting.

Personal Accounts

This application is for managing personal finances though it could also be used for small (non-VAT registered) businesses and managing clubs/societies accounts. !Personal installs itself on the icon bar and a file may be loaded by dragging it onto the icon in the normal way. Unfortunately, there is no filetype allocated for !Personal data files so double-clicking on a file does not start up !Personal. The application is multi-tasking (it calls WIMP_POLL) but does take over the whole screen without using the WIMP facilities to allow movable, resizeable windows. More than one file may be loaded into memory at once. The memory taken up by the application itself is 240k.

It uses a menu based system and obviously a lot of thought has gone into making the system easy and fast to use. The main menu has nine options together with OS commands and LOAD/SAVE file facilities. The function keys may be used as short-cuts for selecting a menu entry.

The basic idea of !Personal is that absolutely every financial transaction is recorded – not just those for, say, your bank account. A report generator can then be used to generate a monthly bank statement for a specified account. For example, you may have a personal bank account, a Building Society savings account and use two credit cards. All transactions are logged and a monthly bank statement can be generated to check against the Bank statement. The report generator has fairly sophisticated search criteria to limit the information produced. For example, reports can be kept to a manageable size by either analysing within a range of dates or by restricting to a certain account.

Up to 10 different accounts may be managed, each with an opening balance. There are also categories for each of your main sources of income and expenses. For example, you can allocate Gas, Electricity and Telephone Bills and your monthly rent into different categories to enable budgeting and analysis of precisely where your money goes each month.

Entering a transaction is made easy by the fact that the category headings are displayed in full as each field is completed. You don't have to look up on another menu which code you assigned for Petrol. Entries can be marked as Paid, Unpaid and Reconciled which can help you tally your statement with the Bank's version. Modifying and deleting entries is also easy. Both the cursor keys and the mouse may be used to select entries and scroll the display.

There are comprehensive facilities for entering regular standing orders of differing frequencies and useful quick-entry presets to store common transactions.

Selecting cells for entry or update can either be done using the arrow keys or the mouse. Home scrolls to the top of the display while the Page Up/Down keys (somewhat counter-intuitively) search backwards/forwards for the next entry as the current cell where you might expect to scroll up/down a page.

There is a simple Calculator option which would be obsolete if !Personal were made 'truly' multi-tasking and allowed your favourite desktop calculator to be running in parallel.

Entering transactions is made easier by the fact that by pressing <return> after the first field (day) assumes the previous values for the month and year fields. A useful feature is that transactions are automatically sorted into date order. The manual contains an easy to follow tutorial which introduces most of the available features.

Transferring details to another file is also easy. All the information can be carried over without having to set up all the headings/categories again.

For all the ease of use features, there is worrying lack of error checking on the SAVE operation (at least on my review copy). Attempting to save your hard work to a protected or full disc or a non-existent directory does not report any error but merely returns to the main menu leaving the impression that all is well! In addition it would be preferable to be able to

configure the printer linefeed option permanently although as the BASIC source is supplied you can tailor it for your own needs.

However the author is very receptive to ideas and suggestions for improvements and he plans to release an upgrade which makes !Personal into a fully WIMP based, multi-tasking application with options to save !Personal reports into plain text format so they can included into editors/DTPs for documents. Despite the minor reservations about the user interface, !Personal is very powerful, good value for money, easy to use and comes highly recommended. As Apricote offer a full money back guarantee why not try it and see for yourself?

(Personal Accounts is £28.95 from Apricote Studios or £27 through Archive.)

The Account Book

This package is aimed at businesses and maintains sales/purchase ledgers with support for VAT accounting. The Account Book uses a different interface from !Personal and obviously has not been rewritten from the BBC/Master version and is started using <shift-break>. Neither the Account Book nor its partner Invoice Book are 'true' RISC-OS applications. The initial menu is a rather garish mode 7 screen. Selecting a menu item only uses cursor keys followed by <return>. Having got used to the !Personal hot-keys for quick access to any menu, I found this rather laborious.

The manual contains a tutorial section but advises against using a Hard Disc. I think more thought should be given to this as most businesses will probably have invested in a HD to speed the accounting process up!

Many of the basic ideas are similar to those used in !Personal.There are payment and sales categories. Calculation of the VAT element can either be done automatically or manually as some merchants may choose to round up whereas the package always rounds down. There is also support for traders using the Cash Accounting scheme whereby you only account for VAT on actual sales/receipts. However, there are some rather irritating differences. Entering amounts require the full amount (including pence) to be supplied. Entering "18" means £0.18 in the Account Book whereas it is taken as £18.00 in !Personal which is confusing. Also, altering entries is more complicated than in !Personal. The entry to be corrected has to be selected by its date rather than simply moving around the display and editing in-situ. In addition, when making a lot of payment entries, saving always returns you to the main menu. It would be better to stay in the Payment sub-menu. Also, the code to delete an entry is the complicated sequence of <ctrl-shift-@> unless this was purposefully chosen to guard against unintentional deletions. It seems impossible to make an existing item autoVAT once it had been defined as manual.

When reviewing entries on the screen, it seems that deleted entries still appear in the list (albeit marked as such).

However, the Account Book does perform a lot of the mundane work involved in maintaining business accounts. Specifically, the quarterly VAT return is calculated from all the Sales/Purchase reports automatically. The VAT accounting period can be altered as appropriate. Once again this package could benefit from being converted to a multi-tasking RISC-OS application as the interface is somewhat unwieldy. For small businesses that are not registered for VAT, I would recommend they try !Personal rather than the Account Book at £34.95 (£32 through Archive).

The Invoice Book

This is a complementary package to the Account Book and provides an easy way of producing and monitoring invoices and managing a customer database. The interface is as for the Account Book. The Customer Database is rather odd in that every entry is assigned (as a deleted entry) so examining the database with less than 10 entries is tedious as there are no searching facilities to look for the next non-null entry and the entries are keyed on their first letter.

Prices (and VAT) of items are held as 'Stock Presets' which allows invoices to be generated from a single line of text. The package allows reminder letters to be produced with messages of increasing severity and queries on the database to enable quick chasing of late and outstanding payers.

The Invoice Book can also link up with the Account Book and update Sales records on production on an invoice.

For the functionality provided by the Invoice Program it seems rather overpriced at £34.95 (or £32 through Archive). A

Desktop Office

John Schild

I still remember the thrill of anticipation with which I dashed home from the shop, tore open the case of my BBC B Microcomputer, carefully inserted an 8k EPROM alongside the 1.2 OS, typed *W. and entered the heady world of word-processing. The new power and freedom was mind-blowing...

... But that was in 1983, and I have to confess that the discovery that the heart of Minerva's 1990 DTO package is a Wordwise look-alike has raised some puzzling questions. There is a great deal in this five-part office suite to commend it and I am sure that many home users will find in it all they need for domestic and hobby purposes. However, I am equally sure that potential education and small business users need to acquaint themselves with its inevitable limitations in order to avoid disappointment. In the rapidly developing software world of the Archimedes, value for money can be very hard to assess and a package offering a word processor, database, spreadsheet, charts generator and comms all for under £130 is impressive. However, please don't expect the combined performance of Impression, Pipedream, Multistore, Presenter and Acom (weighing in together at £620 at Archive prices.)

I have spent some time exploring DTO, and I can confirm that what it does it does soundly – but, by design, not necessarily comprehensively.

The Desk Top Office Package

DTO comes on a single disc without protection and without that annoying "key disc" requirement normally favoured by Minerva. The accompanying manual is competently written and helpfully laid out, opening with brief tutorials and continuing with reference sections on each component program. Transferring the application to a hard disc posed no problems, and clicking on the filer icon opened a directory window displaying icons for the individual applications. All five cannot be loaded together on a 1M machine, but any two will fit quite happily. I disabled 2M of my 440 (by creating a huge RAM disc) and everything ran happily on what was left.

DTO is fully multi-tasking and obeys all RISC-OS conventions. Each program is controlled by hierarchical menus which are generally simple and sensible. The suite is described as "integrated" and routes have been set up to transfer data between the applications in a fairly comprehensive manner but with one glaring omission: you can create charts but can't load them into DTOword.

Word-processor

DTOword is a menu-driven word-processor in the Wordwise tradition. It does not claim to be WYSIWYG, and style and format instructions are entered as embedded commands between F1 and F2 characters in a very familiar way. (So much so in fact, that I discovered you can load Wordwise files to DTOword and it accepts them without complaint except where formatting commands differ). Unlike Wordwise, DTOword allows the user to define the screen width in the edit window, allowing a rudimentary approach to WYSIWYG and there is a facility which some users will find very useful: the display characters can be enlarged for the benefit of children and those with eyesight problems. You don't have to remember all the formatting commands – they may be conveniently picked up from the menu structure. All the usual block operations are provided, significantly enhanced from Wordwise days.

However, there are no printer drivers, so you must know the control codes for your printer: the outline fonts are not used, so the new generation of laser direct printers cannot be employed. No spell checker is provided and, to my great surprise, there is no word count, only a much less useful file length display.

Personally, I find these limitations quite surprising. The word-processor is the workhorse of any office suite, and I find it puzzling that so much effort has been put into developing the menu structure for convenience and ease of use, while other facilities of potentially greater relevance have been neglected. DTOword will prove adequate for routine correspondence, but not for assembling complex documents requiring careful tabbing or the insertion of graphics.

Database

DTObase immediately reveals its Minerva ancestry.

New databases are easily created within a window environment. String, numeric, date and formula field types are supported and can be placed where you like on the card. Records can then be sorted and searched, browsed and edited via a Tools window employing what it is now fashionable to describe as a video type display. In the present version, search facilities are restricted to "string anywhere in field", yielding some rather misleading results. However, Minerva have promised to include a much wider range of search options in a future issue. There is no transfer option to enable extra fields to be added after creation.

During a search operation, cards are "marked" for further attention, such as printing, but this is as far as "sub-sets" are supported. Report creation is similarly restricted to the printing of cards as they stand, or the listing to printer or disc of the contents of selected fields. Field calculations using the basic maths operators are supported. If your needs are limited to a friendly and unsophisticated electronic card-index, you will enjoy DTObase.

DTOsheet

DTOsheet is a small spreadsheet which Minerva have undertaken to enlarge in due course. New sheets are easy to set up and, once complete, entering new data is a delight. I would regard the cell status (and data entry) box as the application's crowning glory. Everything you need to know about a cell is displayed in the box, summoned from F1 or the menu, and recalculation is very fast indeed. A single row or column can be held on the screen while the sheet is scrolled, so that "what if" test operations can be carried out and the end result observed on the screen. Only the basic arithmetical operators are supported, along with 10 useful "functions", such as INT and ROUND. Comparison is invidious but compared with Pipedream's 60+ functions it is a bit sparse and I would have thought barely adequate for business use.

Minerva have promised to enlarge the sheet area from its present 32 by 64 to something bigger. I would also urge them to increase the number of functions and allow a "new view" option so that different parts of a large sheet might be displayed in concurrent windows.

Charts

DTOchart allows the importing of CSV (comma separated value) data from DTOsheet or other sources, building it into one of the four standard chart forms: bar, line graph, scattergraph and pie chart. Three lots of data can be loaded and superimposed in the three formats excluding pie-charts. Data can also be input from within DTOchart itself but with a limit of 20 values. Performance is also limited by the fact that text can only be added using paint and the output is in the form of a bit mapped image (sprite) requiring a lot of memory and not as easy to alter and manipulate as a draw file.

Comms

I'm not at home with comms software, and I am therefore not the best judge. However, the verdict after examination is that it works very adequately. Perhaps its most useful feature is that script files can be written, stored and loaded, allowing frequently used operations to be repeated with ease. Users of Hayes compatible modems can call up a script and let it dial out and log on for them. Input from the modem is displayed in a text window and can be saved to disc.

In this area I did not find answers to all my questions in the manual but this may only reveal by own inexperience.

!Flasher

A sixth application has quickly established itself among my favourite toys: "!Flasher" loads to the icon bar and clicking on it sends the pointer scurrying across the screen to land on the caret in the active window, bringing this to the front if necessary (optionally making it flash too). Quite wonderful, and it seems to work on all windowed applications.

Conclusions?

I'm not sure there can be many. It is a very valuable thing that Minerva have done but they may not have got it all right from the beginning. Archive 4.1 p40 hints that they have taken heed of a number of criticisms of this software and have promised some enhancements. If Minerva submit future issues for review, Archive will publish an update.

In the meanwhile, the responsibility lies where it always has – with the buyer – to check out the critical areas before parting with any money. Certainly, no

other Archimedes package offers so many office facilities in one package for that amount of money but you need to ask, "How soon will I grow out of it and have to spend more on grown-up versions of the same utilities? And will I get my money's worth out of it before that happens?"

I think that if I were starting from scratch, I would be hard pressed to choose between DTO and, for instance, Pipedream. Pipedream isn't for the faint-hearted, but it does offer fully integrated word processing (including outline fonts and graphics) spreadsheet and database. Regular readers of Gerald Fitton's column will know that the chances of growing out of Pipedream are remote – after 12 months of admittedly intermittent use I am still trying to grow into it! Comms and charts can be added, when needed, from other sources. Also, I wonder, what are the chances of assembling a Public Domain suite of starter programs? A

TABS – 3D Model Maker

Les Deegan

Purchasing software for use in school CDT departments is a business that requires much thought. Most software available comes under the heading CAD and although this is commonly considered as Computer Aided Design it really should be titled Computer Aided Draughting. I do not wish to criticise this kind of software because it is usually very good at what it claims to do but it does have its limitations, especially to younger pupils who do not find the computer an easy aid to draughting. An application that would allow pupils to build 3-D objects on the screen and then view them from different angles and distances is something I have been seeking to use in the classroom.

Euclid is such an application and clever as it is, I have found it too difficult to use with a wide band of abilities and ages. It was with great interest that I took up the opportunity to review a new piece of software called TABS from Tap Consortium.

The claim

TABS claims to be a 3-D modelling tool for the Archimedes range of computers with a very interesting output. Designs can be plotted as developments with small tabs. The plotted (or printed) output can be cut out, folded and glued together to produce a paper model of the original design.

The application

On start up, the user is presented with a tool box of basic solid objects. They are a cube, cylinder, funnel (truncated cone), wedge and cone. It is assumed that most objects can be built from these shapes and, within limitations, this is probably true. Curved surfaces are comprised of a series of flats. The more flats, the nearer the surface is to a true curve. This, however, makes for a more complicated development as each flat has its own glueing tab. The number of tabs is a selectable option and needs to be given careful consideration when building on the screen.

Another useful feature is the ability to draw any enclosed shape with a series of straight lines and then being able to extrude that shape into a solid object.

Creating and manipulating the objects, at first, was quite confusing. Although brief instructions appear on the screen, it is not obvious exactly what is happening, especially when creating the third dimension of a selected object. The manual makes a serious attempt to overcome this problem by using its own simple instruction language but I feel that it is only partially successful. In fairness, however, these problems are quickly overcome by experimentation. (This piece of software could be a good excuse for breaking the golden rule "Read the manual first".) The manual made much more sense after an hour or two of "playing".

Other features from the tool box include a palette for changing the colour of objects and a replicate feature for copying a created shape like the multiple use of same sized wheels. A delete and undo feature is also available and this takes quite a time to master since selecting an object to be deleted is not as simple as it could be. It is possible to find yourself creating an unwanted object when you are trying to delete or move another one. It is also possible to reduce the size of the toolbox so that the Edit Window size can be increased whilst keeping the toolbox in view. Once the object has been created it can be rotated in the x, y and z planes so that a realistic impression of the final model can be seen.

Objects are created in the Edit Window but two more windows are available from the main menu – they are View and Nets. View gives a 3 dimensional image which can be wire frame or solid and rotated about the x, y and z axis. Orthographic and perspective views are also selectable. The Nets Window is basically a plan of the sheets of paper on which the developments of the objects are placed. The Nets (developments) can be positioned and rotated in the Nets Window to allow to the most economical use of paper. It is possible, if required, to place each net on a separate sheet of paper.

Output is via a menu in the Nets Window and although a printer driver must be loaded if this option is required, other drivers are included for the Plotmate A3M and HPGL plotters. I used the A3M (default option) with very satisfactory results, although care must be taken when positioning the nets as "chopping" of the final output can occur if the net is too near the page border.

A useful addition is the facility to be able to select a slow pen speed for non-standard pens and a two colour feature which draws the outline in one colour and the folds in another. (A useful feature when you have pupils armed with scissors and eager to cut any line in sight).

The finished developments can be exported to a variety of other software for further work. I managed quite easily to add some artwork to a development by importing it into Draw. A more useful export, however, (although I did not try this) is probably to LinCAD. The net is converted to a VDU file for further work in this CAD package before plotting on the Plotmate. I assume that this can also be spooled with other Linear Graphic's software such as Linsign to give a useful, compatible suite of design programs. Export is also possible to Euclid (needs a converter) and ARCOL.

Because of its ability to handle different paper and card thicknesses I would recommend the use of a plotter rather than a printer. The resolution and speed advantages of a plotter are also far greater than that of the printer.

A nice touch is a supplement to the manual showing how to build a simple model steam locomotive with hints on paper quality, printing/plotting, cutting and gluing techniques. The manual states that at least four hours are required for this task. Thirty minutes being spent at the screen and the remainder cutting and glueing. This ratio of time is probably true for most models.

The "acid test"

The success of any software directed at the education market should be how well it performs in the hands of an eager pupil.

As "test pilots" a pair of twelve year old pupils were chosen (one male and one female of course). I was not confident that progress would be made quickly and this was confirmed when early attempts at producing images on the screen met with little success. After I had given them some instruction and guidance, I was pleased with the speed at which progress was made and, within an hour, models were produced of all the available forms.

Providing pupils are directed into tasks consistent with their age and ability, they should achieve reasonable success in most cases.

Conclusion

At £95 (single machine), £280 (site licence) TABS seems to be priced consistently with other similar software although perhaps a bit on the expensive side for many CDT departments. I found it extremely useful in linking a computer application with a practical task, something many other CAD packages seem to fail to do. It can be used with most ages and abilities, probably even in upper primary schools, although it is unlikely that they would have the necessary hardware.

I think that the Mathematics Department could also benefit from this package because of its strong geometrical content and, with imagination, it could help with cross curricular links in the National Curriculum.

On the minus side, I feel that the manual could be more friendly, especially in helping people get started. A useful feature also, would be the ability to create curved shapes in the extrusion option, instead of just straight sided shapes. Also, the word 'net' may be a confusing replacement for the word 'development', especially in CDT departments, which are still ably manned by many ex technical drawing teachers. The above are minor points however and should not distract any would be purchasers from what I consider to be an interesting and useful piece of software. A

SCSI Column

Paul Beverley

• **42M Removables** – We mentioned last month that we were having problems with running the MicroNet 42M removable drives on the Lingenuity and Acorn podules. We have since discovered that the problem was confined to certain of the MR45 drives – others seemed to work OK though not as fast as with the Oak podule. We discovered that some of the MR45's had an early version of their SCSI software which the Oak podule managed to handle successfully but which the other two just couldn't cope with. Jack Lillingstone of Lingenuity very kindly persuaded SyQuest in the U.S.A., makers of the drives in the MR45's, to send us some new ROM chips. So now that these have all been updated, it doesn't matter which podule you have, they will all work. If you are interested in the speed comparisons, the Oak podule runs the "better test" in 10.0 / 11.8 / 12.9 seconds in modes 0 / 15 / 21, the Acorn board takes 16.4 / 19.2 / 21.1 seconds (slower by 29% in each mode) and the Lingenuity board takes 12.6 / 13.3 / 17.5 seconds (slower than Oak by 21% / 21% / 26% in the three modes).

• **42M Removables robustness test** – I heard from someone that the discs for the MR45's were extremely robust and that you could drop them on the floor and not damage them so I took my courage in both hands and tried it. First I took a disc out of its case and "frisby-ed" it half way across the office (wooden floor with carpet tiles). It bounced and rolled over once. I then tried to verify it – not a duff track anywhere. I then plucked up a bit more courage and tried to throw it even further across the room. Unfortunately, I didn't get my aim quite right – it hit a desk and knocked a (large) telephone onto the floor! The telephone, fortunately, was completely unscathed. The disc? I gingerly put it in the drive and ran the verify on it – not a single fault on it! Now that's what I call a robust hard disc. In case you want to try it yourself, remember that it was the **disc** that I threw across the room, not the whole disc drive!

• **Disappearing Oak drive icons.** Users of Presenter II and GraphBox who have tried to use Hotlinks may have found that, when the link is established, the SCSI drive icon disappears off the icon bar! This is not a problem with the Hotlinks software but with earlier versions of the Oak software. If you have this problem, contact Oak Computers who will send you an up-to-date ROM for your SCSI podule. A

Fun School 2

Mick Dunford

Fun School 2 was first produced for the Model B and is reputed to have sold over 60,000 copies. These programs have been ported onto the Archimedes and modified to take advantage of the newer machine's superior graphics capabilities. There are three sets of programs for three age groups: under-sixes, six to eight year olds and over-eights.

The contents

In each case, the disc (two discs in the case of the over-eight suite) contains six to eight short programs. These programs seek to develop numerical, reading and comprehension, spatial, logical and coordination skills on the one hand and keyboard and computer skills on the other. In most cases, there are several levels of difficulty. Children start at the lowest level and advance as their competence increases but there are options that adults (or indeed older children) can access to alter the initial level of difficulty. There is also a choice of using the keyboard alone or the mouse and the keyboard, while in wordgames, parents or teachers can make their own lists of words for the programs to use.

In use

In working through the programs, the only difficulties that Lotte (aged 8) and Robin (aged 4) encountered were connected with variations in the keys required in different programs. Some of the choices are curious. In an under-six program, for example, in which letters have to be picked up and moved to a particular location, the middle and right mouse buttons are used to drop the letter. The middle one is used if the letter picked up was the wrong one and the right one is used to drop the correct one when the pointer is

over the destination. Why not use one button to drop a letter? Of course, in a set of programs that are wide in range, a standard interface is not feasible but, in that case, what the program ought to offer is more on-screen help. Without it, children are dependent on adults who are able to read and explain the documentation that comes with the programs. (The documentation, it must be said, is very clear but is intended for adults).

Each suite of programs has its own symbol: a teddy in the under-six suite, a frog in the six to eight, and a robot in the over-eight. Successful completion of a task is rewarded but the rewards tend to be repetitive: the teddy, for example, will jump up and down. The over-eight's suite is better in this respect, in that successful completion of the different programs elicits a keyword which is required to solve the final puzzle. Sound is also used to indicate correct and incorrect answers, which is justifiable, and to accompany the programs, which is not: after a while the constant repetition of the same tune becomes very tedious.

Under sixes

The programs themselves however do live up to their claim to be enjoyable while developing skills. The under-six suite of programs involves shape matching, counting, writing, spelling, letter matching activities as well as a final task of leading a teddy through a maze to a picnic. My one reservation concerns the shape matching where the program considers it incorrect to suggest that two objects whose shape is the same but whose sizes differ (a large and a small circle, triangle, rectangle...) have the same shape. (The intuition of the children who played it was different and I think their intuition is correct and the programmer wrong).

Six to eights

The six- to eight-year programs involve a higher proportion of mathematical activities. There is also a very enjoyable game that involves throwing a red ball at an apple: the ball has to be bounced off walls and obstacles and involves judgements about angles. Another requires a child to guess a word. If the child succeeds, a caterpillar devours an apple.

Over eights

For over-eights there are programs that involve completing jigsaws, unscrambling words, finding ways through mazes and deciphering codes. There is, therefore, quite a strong emphasis on the solution of logical problems.

Conclusion

At the start of this review, I expressed several reservations about the lack of a consistent user interface and of onscreen help and the repetitive character of rewards and the music. The value of the programs is, on the other hand, twofold: the programs are very enjoyable and, since each disc contains six or more programs with several levels of difficulty and since teachers and parents can modify the programs, the amount of use one can get out of them is much greater than is the case with many educational programs written for young and very young children. A

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